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MINNESO'TA, one of the United States, lies in lat. 43° 30' to 49° n., and long. 89° 29' to 97° 5' west. It is 380 m. in extreme length from n. to s., and from 183 to 337 from e. to w., containing an area of 83,531 sq. miles. It is bounded on the n. by the British possessions, from which it is separated by the chain of lakes and rivers connecting the lake of the Woods with lake Superior, and by the 49th parallel of latitude; e. by lake Superior and Wisconsin; s. by Iowa; and w. by Dakota territory (q.v.), from which it is partly divided by the Red river of the north. It contains 75 counties, and its chief towns are St. Paul, the capital, Red Wing, Winona, Hastings, Minneapolis, etc. Minnesota contains the summit of the central table-land of the North American continent, where, within a few miles of each other, are the sources of rivers which find their outlets in Hudson's bay, the gulf of St. Lawrence, and the gulf of Mexico. The state is abundantly watered by the Mississippi, Minnesota, Red river of the north, Rainy Lake river, and their branches, and has more than 1500 m. of navigable rivers. The country abounds also in lakes and ponds. The sources of the great rivers are 1680 ft. above the level of the sea. Though the most northerly state in the union, Minnesota is one of the most beautiful, fertile, and salubrious. The winters are long and cold, but equable, and the country is rich in fertile lands and forests. The clear waters are stored with fish, and game is abundant. The scenery is varied and beautiful. The falls of St. Anthony on the Mississippi afford abundant water-power. Near these is the beautiful cascade of the Minnehaha, or laughing water, 45 ft. perpendicular, and a cavern, explored to the depth of 1000 feet. Minnesota began to be settled in 1845, though it was explored by the French and trading-posts established in 1680. The chief route to the British settlements of the Red river of the north lies through Minnesota. The state has plenty of good timber, and is rich in minerals, including gold, iron, copper, coal, and lead. In 1870 its agricultural products were valued at $33,446,400. In the same year it had 6 universities and colleges, and 2,424 public schools. In Jan., 1875, 1940 m. of railway were completed, and about 1000 more projected, towards which grants of land have been made to the extent of nearly $4,500,000. Powerful Indian tribes occupy portions of the state. The state government was organized in 1858. Pop. '60, 172,023; in '70, 439,706.

MINNESOTA (*ante*). In 1680 a party of French fur-traders ascended the Mississippi to the falls of St. Anthony, where they formed a settlement. Louis Hennepin, a Franciscan priest, accompanied them, and gave the falls the name which they have since borne. This was the first white settlement made within the limits of the state, and it soon degenerated by the adoption of Indian manners and habits. In 1763 the territory was ceded to Great Britain; in 1766 it was explored by capt. Jonathan Carver, of Connecticut; and in 1783 it become a part of the United States, and was included in the northwest territory. In 1805 a tract of land at the mouth of the St. Croix and another at the mouth of the Minnesota were purchased of the Indians, but the region was settled slowly. In 1820 fort Snelling was built, and two years later a mill was erected on the site of Minneapolis. In 1823 the first steamboat ascended the Mississippi to the falls of St. Anthony. Some time before 1830 a small colony of Swiss settled near St. Paul. It was not until 1838 that the Indian title to lands e. of the Mississippi was extinguished, and a settlement was commenced at Stillwater in 1842. In 1849 the territory of Minnesota was organized by act of Congress, the w. boundary being the Missouri river. The population of the territory at this time did not exceed 5,000. Two years later the Indian title to the lands (except the reservations) between the Mississippi and the Red river of the north was extinguished, and from this time the settlement of the territory was rapid, immigrants pouring in so fast that in 1857 congress opened the way for its organization as a state, and it was admitted to the union May 11, 1858. The new state grew rapidly in population, wealth, and intelligence. After the breaking out of the rebellion, 1861, the Sioux Indians, taking advantage of the absence of great numbers of able-bodied citizens, attacked the new settlements, massacring families, burning villages, and driving the almost defenseless inhabitants from their homes in a state of utter destitution. The assault had for excuse the injustice which has marked the whole history of the United States in its dealings with the Indians; but there could be no justification for the savage cruelties inflicted upon the whites, nearly 1000 of whom perished. The outbreak was speedily and effectually suppressed, and the tribe removed from the state. There is still in the state a considerable body of friendly Chippewas, dwelling upon several reservations and making no trouble.

The surface of the country is, for the most part, undulating, with no mountain ranges, but with a low, broad elevation in the northern part, which divides the waters flowing toward the Mississippi from those which empty into Hudson's bay, and both these from those which find their way to the Atlantic through the St. Lawrence. The divide at its highest point of elevation is not more than 100 ft. above the adjacent country, though it is 1680 ft. above the ocean, and nearly 1000 ft. above the extreme s. part of the state, the descent toward which is so gradual as hardly to attract observation. Three-fourths of the state are rolling prairie, interspersed with oak openings, belts of timber, and innumerable small lakes, and drained by numerous streams of clear water. The remaining fourth includes the divide above-mentioned, the mineral tract near lake Superior, and the heavily wooded region around the sources of the Mississippi and the Red river of the north. The state is mostly drained by these two rivers, by the St. Louis, and their numerous tributaries. The chief affluents of the Mississippi are the Minnesota (itself a noble river, with numerous branches), the Root, Zumbrota, Cannon, Sauk, Crow Wing, Willow, St. Croix, and Rum river, the outlet of Mille Lacs lake. The Red river has several branches—the Buffalo, Wild Rice, Red lake, etc.; while the Ushkabwaka, Big White Face, Stone, Floodwood, and Savannah are tributary to the St. Louis. A multitude of small streams flow into lake Superior, while the Vermillion, Little Fork, Big Fork, and others discharge into the Rainy Lake river and the chain of lakes which form a part of the n. boundary of the state. The Mississippi is navigable within the state for 540 m., the St. Croix for 53 m., the Minnesota at high water for 300 m., the Red river for 250 m., and the St. Louis for 21 miles. One thirty-fifth of the entire area of the state is covered with lakes. The largest of these are Leech, Red, Mille Lacs, Vermillion, Winnebegoshish, Big Stone, Traverse, Cass, Otter Tail, and Itasca. The navigable waters of the state have a shore line of 2,700 miles.

Iron and copper ore of excellent quality are found in the section bordering upon lake Superior, and iron also in the s. and s.w. portions of the state. Gold and silver in moderate quantities are found in the neighborhood of Vermillion lake, but the region is so wild and inaccessible that the mines are not worked. The n. portion of the state, along the Red river valley and the basins of the lakes and streams which form the n. boundary, is one of the finest wheat-producing regions in the world. The prevailing forest growths in this region are the oak, beech, elm, and maple. The n.e., or mineral, portion of the state is less productive, though it yields fair crops. Much of it is covered with a heavy growth of pine, spruce, and other woods valuable for timber. The three-fourths of the state lying s. of the highlands is a country of unsurpassed fertility. About one-third of all the land surface of the state is covered with forest. A tract on both sides of the Minnesota river, over 100 m. long and of an average width of 40 m., is known as the Big Woods, wherein are almost every species of deciduous trees found anywhere in the northern states. On the prairies have been planted more than 20,000,000 of forest trees, the state tempting the owners of the land to this species of culture by liberal bounties. The hardier fruits, such as apples, crab-apples, pears, cherries, plums, grapes of the northern varieties, strawberries, raspberries, currants, blackberries, etc., yield abundantly. For peaches and the tenderer sorts of grapes the seasons are too short.

Among the wild animals most common are the gray and prairie wolf, bears, wild cats, raccoons, foxes, gophers, woodchucks, deer, rabbits, and squirrels. The principal fur-bearing animals are the otter, mink, beaver, and muskrat. Feathered game is abundant, including ducks, wild geese, pigeons, grouse, partridges, and wild turkeys. The smaller birds are of numerous kinds, many of them distinguished for their gay plumage or the melody of their songs. The climate is less rigorous than might be expected from the high northern latitude. The winters are indeed long, but the air is dry and the temperature even, on which account the state is a common resort of invalids, especially of those with pulmonary complaints.

The number of miles of railroad in operation in the state at the close of 1878 was 2,608—all constructed within 17 years. The total earnings of the roads in 1878 were $7,431,199; amount of earnings over expenses, $2,958,871; passengers carried, 1,590,649; tons of freight, 2,496,559; state revenue from the roads, $180,000. The whole cost of the roads built before 1875, including real estate and equipments, was $95,312,171.

As an agricultural state Minnesota is not far from the front rank. The growth of wheat (mostly spring-sown) is immense, the yield per acre being larger than that of any other state e. of the Rocky mountains. The grain crops of 1873, stated in bushels, were as follows: Wheat, 26,402,485; oats, 12,544,536; corn, 6,457,368; barley, 669,415; rye, 96,877; buckwheat, 29,445:—total, 46,200,126. Other crops in the same year were thus reported: Potatoes, 2,196,138; flax-seed, 100,853; tons of hay, 144,712; tons of wild hay, 783,619; lbs. of hops, 57,291; sorghum syrup, 53,226 galls.: lbs. of flax, 1,227,547; lbs. of tobacco, 28,324; number of apple trees in bearing, 3,832,038; bushels of apples, 20,307; lbs. of maple sugar, 139,952; lbs. of honey, 134,266; lbs. of wool, 529,856; lbs. of butter, 10,140,313; lbs. of cheese, 1,031,510. The locust plague inflicted great injury upon the growing crops for three successive seasons, beginning in 1874. The insects, coming in vast swarms from the Rocky mountains and settling upon thriving fields, in a few hours devoured every vestige of vegetation. In 1874 the losses from this source were estimated as follows: Wheat, 2,646,802 bush.; oats, 1,816,733 bush.; corn, 738,415 bush.; potatoes, 221,454 bush.; and other crops in relative proportion. In 1875, in 16 counties, the losses were: Wheat, 1,432,573 bush.; oats, 842,965 bush.; corn, 500,958 bush. In seven counties, in 1875, the bounties paid for the destruction of 56,336 bush. of the insects amounted to $78,505. The live stock in the state in 1875 were: Horses, 167,313; cattle, 467,568; mules and asses, 5,257; sheep, 162,807; hogs, 141,810. The number of farms in the state in 1878 was 60,816, covering a tilled area of 3,429,164 acres. The early sugar cane is extensively cultivated: the syrup produced in 1877 amounted to 140,150 galls. The product of 1878 is not accurately reported, but it was much larger than that of 1877.

The water-power of Minnesota is so abundant and so thoroughly diffused as to afford in every part of the state all the manufacturing facilities that could be desired. In 1870 the number of manufacturing establishments was 2,072, with a capital of $11,806,788; producing goods valued at $23,396,097; persons employed, 9,726. The principal lines and their productions were as follows: Flour, $6,982,959; lumber, $5,058,157; sash, blinds, and doors, $1,162,482; carriages, wagons, etc., $595,780; machinery, locomotives, etc., $2,051,288; agricultural implements, $304,575; blacksmithing, $559,501; boots and shoes, $529,204; printing and publishing, $350,386. There has no doubt been a great increase in manufacturing industry in the last ten years, but accurate statistics are lacking. We know that in Minneapolis alone, in 1874, goods were manufactured of the value of $15,000,000. The flour manufactured in the state maintains the first rank. The assessed value of real estate in 1879 was $229,791,042; of personal property, $57,193,455.

The total receipts into the state treasury during the year ending Nov. 30, 1878, including a balance of $133,271 from the previous year, were $1,610,909; the sum disbursed was $1,562,410. The bonded debt of the state in 1875 amounted to $480,000.

The foreign commerce of Minnesota is carried on through the two ports of St. Paul and Duluth, and by steamers to Manitoba on the Red river of the north. The number of arrivals under this head at St. Paul in 1874 was 23 steamboats and 6 barges, with an aggregate of 2,505 tons; imports valued at $15,340. At Duluth, upper end of lake Superior, during the same time, arrived 241 steamers and 47 sailing vessels, of an aggregate tonnage of 168,241 tons, manned by 6,092 men; cleared, 244 steamers and 48 sailing vessels, with an aggregate tonnage of 168,061 tons, and crews of 6,096 men. The foreign goods received were valued at $407,841, and the duties on them amounted to $183,118. The export to other states of lumber, wheat, flour, agricultural implements, etc., and the domestic importation of salt, coal, and merchandise keep the railroads busy.

There were in the state in 1874, 32 national banks, with a capital of $4,448,700, and a circulation of $445,000. There were at the same time 6 state banks, with resources amounting to $1,880,000. There were also seven savings banks, doing a prosperous business. The Farmers' mutual fire insurance association at Minneapolis, in 1874, had assets amounting to $158,302. The St. Paul fire and marine insurance company had a capital of $400,000; assets, $728,632. There were also 62 insurance companies doing business in the state under charters derived from other states. One life insurance company, the Minnesota mutual, chartered by the state, and 32 others chartered elsewhere, were doing business in the state. The population of Minnesota in 1870 was 446,056; in 1875, 609,777; in 1880, 780,806. The males in 1875 numbered 316,076; the females, 281,331; natives of this country, 379,978; foreigners, 217,429, of whom a large proportion were of Scandinavian origin. The first settlers of the state were chiefly from New England, and they went to the new state with a fixed determination to establish therein schools and colleges of a high order of excellence; accordingly much has been done to this end. In 1874 the children of school age (5 to 21 years) numbered 210,194, of whom 128,902—a larger proportion than in any other western state—were in school during some portion of the year. The number of school districts at that time was 3,266; number of schoolhouses, 2,758; valued at $2,238,700; number of schools, 2,789, in which the average attendance was 99,842; number of teachers, 5,482, of whom 1834 were males and 3,648 were females; total amount of teachers' wages, $678,606; average monthly wages of male teachers, $41.57—of female teachers, $30.52. The average annual length of the schools was nearly 7 months, and the whole amount expended for their support in 1874 was $1,155,542. The number of graded schools was 151, and there were high schools in many of the cities and larger towns, in which pupils were fitted to enter the university. The school fund amounted to $3,030,127; and it is expected that by the sale of lands devoted to the purpose it will be eventually augmented to $10,000,000. The state has 3 normal schools, one each at Winona, Mankato, and St. Cloud. The number of pupils in these schools fitting themselves for teachers in 1874 was 905, of whom 548—126 males and 422 females—had been regular in their attendance. Women enjoy the right to "vote at elections for school officers and in matters pertaining to the schools," and are "eligible to hold any office pertaining solely to their management." The university of Minnesota, organized at Minneapolis in 1867, embraces seven departments, viz.: collegiate, scientific, literature, and the arts, agriculture and the mechanic arts, medicine, and law. In all these courses it is intended to be as thorough as any institution of the kind in the United States. It is endowed with both the university and agricultural college lands, which are expected ultimately to produce the sum of $1,000,000. There are in the state two other colleges, viz.: St. John's, near St. Joseph's, a Roman Catholic institution, and Carlton college (Congregational) at Northfield; also, many academies and seminaries, several of the latter especially for girls, and two or three business colleges. There are also three theological schools—the Augsburg evangelical seminary at Minneapolis, St. John's Roman Catholic seminary, and the Seabury divinity school (Episcopal) at Faribault. The public institutions of the state are the reform school of St. Paul, the institution for the deaf, and dumb and the blind at Faribault, a soldiers' orphans' home at Winona, the hospital for the insane at St. Peter's, and the state prison at Stillwater. A second asylum for the insane will soon be completed. There is a private orphan asylum at St. Paul, and another at Shakopee.

In 1874 128 newspapers were published in the state, 15 of which were dailies. The number of libraries in the state in 1870 was 1412, containing 360,790 volumes. The whole number of church organizations in 1874 was 1247; church edifices, 880; church members, 118,705; ministers, 871. The principal denominations, in numerical order, were: Methodists, Roman Catholics, Lutherans, Baptists, Presbyterians, Episcopalians, Congregationalists, German Methodists, Universalists, and Christians.

The governor and other state officers are chosen by a plurality vote for a term of two years. The governor receives an annual salary of $3,000. The legislature, composed of a senate and house of representatives, the number of whose members is fixed from time to time by law, meets annually, the sessions being limited to 60 days. St. Paul is the capital. The election takes place on the Tuesday succeeding the first Monday in November. The supreme court consists of a chief-justice and two associate justices, elected by the people for 7 years, and receiving a salary of $3,000. It has original jurisdiction in cases prescribed by law and appellate jurisdiction in matters of law and equity. In this court there are no jury trials. There are 11 judges of the district courts, each of whom is elected by the people of a district for a term of seven years. In Ramsey co., embracing the city of St. Paul, and Hennepin co., embracing the city of Minneapolis, there are courts of common pleas, whose judges have the same tenure of office as those of the district courts. Minnesota furnished to the army and navy during the war for the suppression of the rebellion more than 25,000 men. The electoral votes of the state for president and vice-president of the United States have been cast as follows: 1860, 4 for Lincoln and Hamlin; 1864, 4 for Lincoln and Johnson; 1868, 4 for Grant and Colfax; 1872, 5 for Grant and Wilson; 1876, 5 for Hayes and Wheeler; 1880, 5 for Garfield and Arthur.

MINNESOTA, or **ST. PETER'S RIVER**, rises near the eastern boundary of Dakota territory, United States, runs s.e. 300 m. to South bend, then n.e. 120 m., and falls into the Mississippi at Mendota. It is navigable for 40 m. by steamboats.

MINNESOTA, UNIVERSITY OF, at Minneapolis, Minn., founded in 1868, under state control, consists of the collegiate department, with 3 courses of study; the college of science, literature, and the arts; the college of agriculture; and the college of mechanics' arts. Departments of law and medicine are to be organized. It is governed by a board of 10 regents, 7 of whom are appointed for 3 years by the governor; the governor, the president of the university, and the superintendent of public instruction are members *ex officio*. Tuition is free to both sexes. There are 19 instructors, and the library contains about 10,000 vols. The present endowment is about $220,000, and will ultimately reach $1,000,000 by the sale of lands. The annual income is about $30,000. The state geological and natural history surveys are in charge of the faculty.

MINNETAREES, or HIDATSA, a tribe of Indians, originally part of the Crow tribe, but for nearly a century associated with the Mandans, and settled on the upper Missouri river. Their number is not more than 450 or 500, having gradually decreased for many years. Treaties have been made with them by the government and a reservation in Montana set apart for them, but they prefer to remain where they are, gaining their living entirely by hunting and fishing. Though friendly to the whites, they have had many wars with the Sioux and other tribes. A dictionary and grammar of the language has been printed.

MIN'NOW, *Leuciscus phoxinus*, a small fish of the same genus with the roach, dace, chub, etc., of a more rounded form than most of its congeners, a common native of streams with gravelly bottoms in most parts of Britain. It seldom exceeds three inches in length, the head and back of a dusky olive color, the sides lighter and mottled, the belly white, or, in summer, pink. Minnows, swim in shoals, feed readily either on animal or vegetable substances, if sufficiently soft, and are said to be very destructive to the spawn of salmon and of trout. Very young anglers generally begin their sport by catching minnow. The minnow is a fish of very pleasant flavor. A casting-net affords the means of taking it in a sufficient abundance. It is a favorite bait for pike and large trout or perch.

MINO BIRD. See MINA BIRD, *ante*.

MINOR, a term used in music. 1. In the nomenclature of intervals. The interval between any note and another is named according to the number of degrees between them on the scale, both notes included. The interval between C and E is called a third; that between E and G is also a third; but these intervals are unequal, the one consisting of four semitones, the other of three; the former is therefore distinguished as a major, the latter as a minor interval. 2. The term is also applied to one of the two modes in which a musical passage may be composed. The scale of the minor mode differs from that of the major mode in the third of its key-note being a minor instead of a major third. See MUSIC, MODE.

MINOR is, in Scotch law, the term describing a person who, if a male, is between the ages of 14 and 21; and if a female, is between 12 and 21. In the preceding period he or she is called a pupil. In England the technical term is an infant (q.v.), which includes all persons, male and female, under the age of 21. In Scotland a minor is for many purposes *sui juris*, and can marry without anybody's consent, and can also make a will of movable property. For the purposes, however, of managing his real property and making contracts, curators are often necessary. See INFANT, RESTITUTION, GUARDIAN.

MINOR BARONS. The word baron, in the earliest period of feudalism, signified one who held lands of a superior by military tenure. The superior might be the sovereign, or he might be an earl or other eminent person, who held of the sovereign. According as he was the one or the other, the baron was, in the earliest sense of the distinction, a greater or lesser baron. At the conquest a large part of the soil of England was parceled by William the Norman among his military retainers, who were bound in return to perform services, to do homage, and to assist in administering justice, and in transacting the other business done in the court of the king. 400 of these tenants-in-chief of the crown are enumerated in Domesday (q.v.), including among them "vicecomites" and "comites," who together constituted the body of men called the barons of England. As the sovereign was entitled to demand from the barons military service, homage, and attendance in the courts, so, many of the principal barons, particularly such of them as were earls, had military tenants, from whom they in turn received homage and assistance in administering justice in their baronial courts. These tenants were barons of the barons, or, in the earliest sense, minor barons; but by the usage of England, from the conquest downwards, they were seldom called barons, that term having been generally restricted to the former class, the holders of land direct from the crown, who were next to the king in dignity, formed his army and his legislative assembly, and obtained the great charter from king John, The subinfeudation which produced the minor barons was checked by a statute of Edward I., directing that all persons acquiring lands from a subject should hold, not of that subject, but of his superior.

Out of the "commune concilium" of the king, at which all his barons were bound to attend, arose the parliament. It is not till the close of Henry III.'s or beginning of Edward I.'s reign that we find a select number instead of the whole barons attending. The exact period of the change, and the way in which it was made, are still among the obscure points of English history; it has been thought that after the rebellion which was crushed at the battle of Evesham, Henry III. summoned only those barons who were most devoted to his interest. From this period a new distinction between major and minor barons arose, the latter term being no longer applied to the barons of the barons, but to those barons of the crown who were no longer summoned by writ to parliament. The word baron was more and more used in the restricted sense of a baron of parliament, and the right or duty of attendance came in process of time to be founded, not on the tenure, but on the writ.

In Scotland the barons (or lairds) were such persons as held their lands directly of the crown. They were the king's advisers, witnessed his charters, and possessed a civil and criminal jurisdiction. All had to give attendance in the Scottish parliament, which consisted of the earls and barons sitting together. After the reign of James I. some of the more powerful barons appear more exclusively as lords of parliament, those whose incomes were below a certain amount obtaining a dispensation from attendance; yet all possessed a right to attend parliament till 1587, when the barons not specially created lords of parliament were required, in place of personally attending, to send representatives of their order from each sheriffdom. The term baron, however, still continued in Scotland to be applied to the whole body of tenants *in capite*, such of them as were lords of parliament being distinctively major, and the others minor barons; but all continuing up to 1747 to possess an extensive civil jurisdiction and a criminal jurisdiction, from which only treason and the four pleas of the crown were excluded. The representative minor barons sat in the same house with the major barons, and their votes continued down to the union to be recorded as those of the "small barrounis."

MINORCA, the largest of the Balearic isles (q.v.) after Majorca, from which it is distant 25 m. n.e. It is 31 m. long and 13 m. in greatest breadth, with an area of about 300 sq. miles. Pop. 37,262. Its coast, broken into numerous bays and inlets, is fringed with islets and shoals, and its surface, less mountainous than that of Majorca, is undulating, rising to its highest point in mount Toro, 4,793 feet above sea-level. Its productions are similar to those of the larger island, although it is neither so fertile in soil nor so well watered as Majorca. The chief towns are port Mahon (q.v.), and Ciudadela. The annual exports are worth £110,000; the imports £100,000.

MINORITES, a name of the Franciscan order (q.v.), derived from the original later denomination adopted by their founder, *Fratres Minores*. This name has left its trace in the popular designation of several localities both in English and foreign cities.

MINOS, the name of two mythological kings of Crete. The first is said to have been the son of Jupiter and Europa, the brother of Rhadamanthus, the father of Deucalion and Ariadne, and, after his death, a judge in the infernal regions. The second of the same name was grandson of the former, and son of Lycastus and Ida. To him the celebrated *Laws of Minos* are ascribed, in which he is said to have received instruction from Jupiter. He was the husband of that Pasiphaë who gave birth to the Minotaur (q.v.). Homer and Hesiod know of only one Minos, the king of Cnossus, and son and friend of Jupiter.

MINOT, GEORGE, 1817–58; b. Mass.; read law in the office of Rufus Choate, and was admitted to the bar in 1839. He soon obtained a large practice in Boston. He reported the decisions of judge Levi Woodbury of the circuit court, and edited, in association with Richard Peters, jr., 8 vols. of the *U. S. Statutes at Large*, and was sole editor of that work from 1848 to 1858. He published in 1844 *A Digest of the Decisions of the Supreme Court of Massachusetts*, and edited, between 1853–54, the *English Admiralty Reports* in 9 vols.

MINOT, GEORGE RICHARDS, 1758–1802; b. Boston; educated at Harvard, and called to the bar. From 1781 to 1791 he was clerk of the Massachusetts house of representatives, and was secretary of the convention called to ratify the federal constitution. He continued the practice of his profession till 1792, when he was appointed judge of probate for Suffolk county. In 1799 he was made chief-justice of the court of common pleas, and from 1800 till his death he was judge of the municipal court of Boston. He published a *History of Shay's Rebellion*, 1788, and a *History of Massachusetts Bay*, 2 vols., 1798–1803. The latter work is in continuation of Hutchinson's.

MINOTAUR (i.e., the bull of Minos), one of the most repulsive conceptions of Grecian mythology, is represented as the son of Pasiphaë and a bull, for which she had conceived a passion. It was half-man half-bull, a man with a bull's head. Minos, the husband of Pasiphaë, shut him up in the Cnossian labyrinth, and there fed him with youths and maidens, whom Athens was obliged to supply as an annual tribute, till Theseus, with the help of Ariadne, slew the monster. The Minotaur is, with some probability, regarded as a symbol of the Phenician sun-god.

MINOT'S LEDGE, a light-house on a ledge of Cohasset rocks from which a fixed light is exhibited and a fog bell is rung. It is 16 m. from Boston, and 8 m. s.e. of Boston light, on the s. coast, a position of great peril to incoming vessels. It is indispensable, as without it, from the nature of the entrance to the harbor, in a n.e. gale vessels would with certainty be driven on the rocks if they failed to make the entrance. It is 1¼ m. from land, and the rock on which it stands, 25 ft. in diameter, is visible only at low water, when the height is for a short time about 3½ ft. above the water line. In 1847 congress made an appropriation for the construction of a light-house at this point, called the Outer Minot, surmounted by a dwelling placed at the height of 55 ft. above the highest rock. A skeleton iron light-house was designed and erected by capt. W. H. Swift of the U. S. engineers at a cost of less than $40,000. It was formed of 8 heavy wrought iron piles, solid 10 in. skeleton shafts, with one additional in the center. The piles were each in 2 parts, connected by cast iron tubes 3 ft. long, the piles being secured to the tubes by large steel keys passing through the tubes and piles; and in its entire construction it was thought to be as secure as modern science could make it; but it stood only 2 years. On April 17, 1851, during one of the heaviest gales known on the coast, it was completely wrecked. A 5¼ in. hawser, anchored to a block of granite in the sea 50 fathoms from the base of the light, was attached at the other end to the top of the structure 63 ft. above the rock used ordinarily for raising boxes, etc. The keeper had carelessly allowed some stores, that should have been below, to remain out on the scaffolding. This was supposed to be one cause of the disaster; and another was the quantity of ice that adhered to the piles. The money for the present structure was appropriated in 1852, and the plans were made in 1855, the success of the enterprise being due to the late chief engineer gen. J. G. Totten, his plans being executed by gen. Barton S. Alexander. It is of conical form 30 ft. at the base, built of granite, the height of the stone work being 88 ft., solid for 40 ft. from the base, the stones dovetailed, and bound together by galvanized wrought iron pins 3 in. in diameter. The portion above this solid work is divided into the apartments of the keeper, 5 stories, with 4 iron floors, his store rooms, and the light on the 6th floor. Two years were required to level the foundation rock, working from April 1 to Sept. 15, and then only when the tide served. The first stone was laid on July 9, 1857; 4 stones were placed in position during the season. In 1858 six courses were laid; the following year the structure reached a height of 60 ft.; and in 1860 it was completed at a cost of about $300,000, and the beacon was lighted.

MINSIS INDIANS. See MUNSEES.

MINSK, a government and province of western or White Russia, lies s.e. of Wilna, and contains 34,860 sq.m., with a population (1870) of 1,182,230, composed chiefly of Russians, Lithuanians, Poles, and Jews, with a small percentage of Tartars and gypsies.

Five-sevenths of the population profess the Greek religion. The chief articles of export are timber, salt, and corn, which are brought by river-carriage to the Baltic and Black sea ports. The principal manufactures are fine cloths, linen, and sugar. The soil is not fertile, and is covered to a large extent with woods and marshes, while in many other places it is a sandy waste; but in general the native products suffice for the wants of the inhabitants. The climate is very severe in winter. Cattle and sheep breeding are pursued with tolerable success. The inhabitants of the south or marshy portion of the province are subject to that dreadful disease, the *plica polonica* (q.v.).

MINSK, the chief t. of the government of the same name, is situated on the Svislocz, an affluent of the Beresina. It is mostly built of wood, but has many handsome stone edifices, among which are the Greek and Roman Catholic cathedrals and seminaries, the church of St. Catharine, a number of educational and philanthropic establishments, a public library, and a theater. The chief manufactures are woolen cloth and leather. Pop. '67, 36,277, many of whom are Jews.

MINSTER. See MONASTERY.

MINSTREL, a musician of the middle ages who was also a poet and singer: the term is applied to a class of persons who were to administer their skill in poetry and music for the amusement of their patrons. The various ways in which the word was written have perplexed the etymology. It appears, however, to have been no more than a consequential usage of the French *ministre* and the Latin *ministri*. They are in low Latin sometimes called plainly ministri; by Chaucer, in his *Dream*, "ministers," and in the old paper roll printed by Leland we find "ministers" who were appointed "to syng." The minstrels appear to have accompanied their songs with mimicry and action, and to have practiced such various means of diverting as were most admired in those rude times, and supplied the want of more refined entertainment. These arts rendered them extremely popular and acceptable in England and all the neighboring countries, where no high scene of festivity was considered complete that was not set off with the exercise of their talents, and where, so long as the spirit of chivalry subsisted, they were protected and caressed, because their songs tended to honor the ruling passion of the times, and to encourage a martial spirit. The minstrels seem to have been the genuine successors of the ancient bards, who, under different names, were admired and revered, from the earliest ages, among the people of Gaul, Britain, and, indeed, through almost all Europe, whether Celtic or Gothic; but by none more than by the early Germans, particularly by the Danish tribes. Among these they were distinguished by the name of scalds, a word which denotes "smoothers and polishers of language." Their skill was considered as something divine, their persons were deemed sacred, their attendance was solicited by kings, and they were everywhere loaded with honors and rewards. When the Saxons were converted to Christianity this rude admiration began to subside, and poets were no longer considered a peculiar class or profession. The poet and the minstrel became two persons. Poetry was cultivated by men of letters indiscriminately, and many of the most popular rhymes were composed amidst the leisure and retirement of monasteries. But the minstrels continued to be a distinct order of men, and obtained their livelihood by singing verses to the harp at the houses of the great. There they were hospitably received, and retained many of the honors conferred upon the bards and the scalds. Although some of them only recited the compositions of others, many of them still composed songs, and all of them could probably invent a few stanzas upon occasion. Some of the longer metrical romances were written by monks, but the shorter narratives were probably composed by the minstrels who sung them, and there is no doubt that most of the old heroic ballads were produced by this order of men From the striking variations which occur in different copies of these old pieces it is evident that they made no scruple to alter one another's productions; and the reciter added or omitted whole stanzas, according to his own fancy or convenience. In England the profession of minstrel was a popular and privileged one from the time of the conquest, but this entertaining class never met with so much royal patronage as during the reign of Richard I. This brilliant crusader, himself an adept in the minstrel's art, invited to his court many minstrels and troubadours from France, and loaded them with honors and rewards such as arms, clothes, horses, and money. The well-known story of Richard's favorite minstrel, Blondell de Nesle, discovering his royal master by singing a French chanson under the walls of a German castle in which he was a prisoner, has never been authenticated, but it presents a popular illustration of the traditional devotion of the royal minstrel to his art. The instances of regard shown to minstrels during subsequent reigns are abundant. Edward II. rewarded his minstrel William de Morle, known as "Roi de North," with certain houses which had previously belonged to the degraded minstrel John de Boteler, called "Roi Brunard." We also find from Rymer that in 1415, when Henry V. was on his voyage to France, he was accompanied by eighteen minstrels, who were to receive twelve pence a day. Indeed, the minstrels were often in those days more amply paid than the clergy. From the time of Edward IV., however, the real character of the original minstrels was gradually lost; and they were seldom called upon to furnish a specimen of their venerable art except when some great personage condescended on a public occasion to patronize the rude pastimes of his ancestors. The genuine minstrel was seldom to be found in England, and the name had become so far degraded as popularly to denote a mere musician. It is true that at the magnificent entertainment of queen Elizabeth by Leicester, at Kenilworth castle, in 1575, a person was introduced to amuse the queen, in the attire of an ancient minstrel, who called himself "a squire minstrel of Middlesex," but this was no doubt a part of the masquerade. Before Elizabeth closed her reign the degradation of minstrelsy was completed. By a statute in her 39th year, minstrels, together with jugglers, bear-wards, fencers, common players of interludes, tinkers, and peddlers, were included among rogues, vagabonds, and sturdy beggars, and were adjudged to be punished as such.

MINT, *Mentha*, a genus of plants, of the natural order *labiatæ;* with small, funnel-shaped, 4-fid, generally red corolla, and four straight stamens. The species are perennial herbaceous plants, varying considerably in appearance, but all with creeping rootstocks. The flowers are whorled, the whorls often grouped in spikes or heads. The species are widely distributed over the world. Some of them are very common in Britain, as Water Mint (*M. aquatica*), which grow in wet grounds and ditches, and Corn Mint (*M. arvensis*), which abounds as a weed in cornfields and gardens. These and most of the other species have erect stems. All the species contain an aromatic essential oil, in virtue of which they are more or less medicinal. The most important species are Spearmint, Peppermint, and Penny-royal.—Spearmint or Green Mint (*M. viridis*), is a native of almost all the temperate parts of the globe: it has erect smooth stems, from 1 ft. to 2 ft. high, with the whorls of flowers in loose cylindrical or oblong spikes at the top; the leaves lanceolate, acute, smooth, serrated, destitute of stalk, or nearly so. It has a very agreeable odor.—Peppermint (*M. piperita*), a plant of equally wide distribution in the temperate parts of the world, is very similar to spearmint, but has the leaves stalked, and the flowers in short spikes, the lower whorls somewhat distant from the rest. It is very readily recognized by the peculiar pungency of its odor and of its taste.—Penny-royal (*M. pulegium*), also very cosmopolitan, has a much-branched prostrate stem, which sends down new roots as it extends in length; the leaves ovate, stalked; the flowers in distant globose whorls. Its smell resembles that of the other mints.—All these species, in a wild state, grow in ditches or wet places. All of them are cultivated in gardens; and peppermint largely for medicinal use and for flavoring lozenges. *Mint sauce* is generally made of spearmint; which is also used for flavoring soups, etc. A kind of mint with lemon-scented leaves, called Bergamot Mint (*M. citrata*), is found in some parts of Europe, and is cultivated in gardens. Varieties of peppermint and horse-mint (*M. sylvestris*), with *crisped* or inflato-rugose leaves, are much cultivated in Germany under the name of Curled Mint (*Krause-minze*); the leaves being dried and used as a domestic medicine, and in poultices and baths. All kinds of mint are easily propagated by parting the roots or by cuttings. It is said that mice have a great aversion to mint, and that a few leaves of it will keep them at a distance.

Peppermint, penny-royal, and spearmint are used in medicine. The pharmacopœias contain an *aqua*, *spiritus*, and *oleum* of each of them; the officinal part being the herb, which should be collected when in flower. *Peppermint* is a powerful diffusible stimulant, and, as such, is antispasmodic and stomachic, and is much employed in the treatment of gastrodynia and flatulent colic. It is also extensively used in mixtures, for covering the taste of drugs. *Penny-royal* and *spearmint* are similar in their action, but inferior for all purposes to peppermint. The ordinary doses are from 1 to 2 ounces of the *aqua*, a dram of the *spiritus* (in a wine-glassful of water), and from 3 to 5 drops of the *oleum* (on a lump of sugar).

MINT (Lat. *moneta*), an establishment for making coins or metallic money (see Money). The early history of the art being traced under the head Numismatics, the present article is mostly confined to a sketch of the constitution of the British mint, and of the modern processes of coining as there followed.

The earliest regulations regarding the English mint belong to Anglo-Saxon times. An officer called a reeve is referred to in the laws of Canute as having some jurisdiction over it, and certain names which, in addition to that of the sovereign, appear on the Anglo-Saxon coins, seem to have been those of the moneyers, or principal officers of the mint, till recently, an important class of functionaries, who were responsible for the integrity of the coin. Besides the sovereign, barons, bishops, and the greater monasteries had their respective mints, where they exercised the right of coinage, a privilege enjoyed by the archbishops of Canterbury as late as the reign of Henry VIII., and by Wolsey as bishop of Durham and archbishop of York.

After the Norman conquest, the officers of the royal mint became to a certain extent subject to the authority of the exchequer. Both in Saxon and Norman times, there existed, under control of the principal mint in London, a number of provincial mints in different towns of England; there were no fewer than 38 in the time of Ethelred, and the last of them were only done away with in the reign of William III. The officers of the mint were formed into a corporation by a charter of Edward II.; they consisted of the warden, master, comptroller, assay-master, workers, coiners, and subordinates.

The seignorage for coining at one time formed no inconsiderable item in the revenues of the crown. It was a deduction made from the bullion coined, and comprehended both a charge for defraying the expense of coinage, and the sovereign's profit in virtue of his prerogative. In the reign of Henry VI., the seignorage amounted to 6d. in the pound: in the reign of Edward I., 1s. 2½d. By 18 Car. II. c. 5, the seignorage on gold was abolished, and has never since been exacted. The shere, or remedy, as it is now called, was an allowance for the unavoidable imperfection of the coin.

The function of the mint is in theory to receive gold in ingots from individuals and return an equal weight in sovereigns; but, in point of fact, gold is now exclusively coined for the bank of England, for, though any one has still the right to coin gold at the mint, the merchant or dealer has ceased to obtain any profit for so doing, as the bank is compelled to purchase all gold tendered to it at the fixed price of £3 17s. 9d. an ounce. The increment on the assay (q.v.), or on the fineness of the metal, which augments the standard weight, and therefore the value of the gold, is a more considerable source of profit to the importer of gold. The ordinary trade assay, on which the importer purchases the bullion, does not, by usage, come closer than ⅛ of a carat grain, or 7½ grains per lb. troy. Before being coined the gold is subjected to a second and more delicate assay at the mint, and the importer receives the benefit of the difference, amounting to about $\frac{1}{16}$ of a carat grain = 3¾ troy grains, or nearly 8d. per lb. weight.

Silver, which was formerly, concurrently with gold, a legal tender to any amount, has, by 56 George III. c. 68, ceased to be so. There is a seignorage on both silver and copper money, amounting in silver to 10 per cent. when the price of silver is 5s. per ounce, which, however, from the tear and wear of the coin, brings small profit to the crown. On the copper coinage the seignorage is no less than 100 per cent on the average price of copper. The profits of the seignorage, formerly retained by the master of the mint to defray the expense of coinage, have, since 1837, been paid into the bank to the credit of the consolidated fund.

A new mint was erected on Towerhill in 1810. In 1815 some alterations were made in its constitution; and in 1851 a complete change was introduced in the whole system of administration. The control of the mint was vested in a master and a deputy master, and comptroller. The mastership, which had in the early part of the present century become a political appointment held by an adherent of the government, was restored to the position of a permanent office, the master being the ostensible executive head of the establishment. The operative department was intrusted to the assayer, the melter, and the refiner. The moneyers, who had from early times enjoyed extensive privileges and exemptions, and were contractors with the crown for the execution of the coinage, were abolished, and the contracts with the crown were entered into by the master of the mint, who also made subordinate contracts for the actual manufacture of the coin. Farther changes were made on the administration of the mint in 1869. The mastership was added to the duties of the chancellor of the exchequer, without any addition of salary, and the offices of deputy master and comptroller were amalgamated. A yearly saving of £10,000 is believed to have been effected by the changes of 1851, and a further £8,000 by those of 1869, with an increase of efficiency. It is at present in contemplation to remove the mint from Towerhill to the rear of the Thames embankment at Whitefriars, with new and improved machinery. Mints have lately been established at Sydney and Melbourne to coin the gold so largely found in Australia.

Processes of Coining.—Down to the middle of the 16th c. little or no improvement seems to have been made in the art of coining from the time of its invention. The metal was simply hammered into slips, which were afterwards cut up into squares of one size, and then forged round. The required impression was given to these by placing them in turn between two dies and striking them with a hammer. As it was not easy by this method to place the dies exactly above each other, or to apply proper force, coins so made were always faulty, and had the edges unfinished, which rendered them liable to be clipped. The first great step was the application of the screw, invented in 1553 by a French engraver of the name of Brucher. The plan was found expensive at first, and it was not till 1662 that it altogether superseded the hammer in the English mint The chief steps in coining as now practiced are as follows: The gold or silver to be coined is sent to the mint in the form of *ingots* (Ger. *eingiessen*, Du. *ingieten*, to pour in, to cast), or castings; those of gold weighing each about 180 oz., while the silver ingots are much larger. Before melting, each ingot is tested as to its purity by assaying (q.v.), and then weighed, and the results carefully recorded. For melting the gold, pots or crucibles of plumbago are used, made to contain each about 1200 oz. The pots being heated white in furnaces, the charge of gold is introduced along with the proper amount of copper (depending upon the state of purity of the gold as ascertained by the assay), to bring it to the standard, which is 22 parts of pure gold to 2 of copper (see ALLOY). The metal when melted is poured into iron molds, which form it into bars 21 in. long, 1¼ in. broad, and 1 in. thick, if for sovereigns; and somewhat narrower if for half-sovereigns. For melting silver (the alloy of which is adjusted to the standard of 222 parts of silver to 18 of copper), malleable iron pots are used, and the metal is cast into bars similar to those of gold.

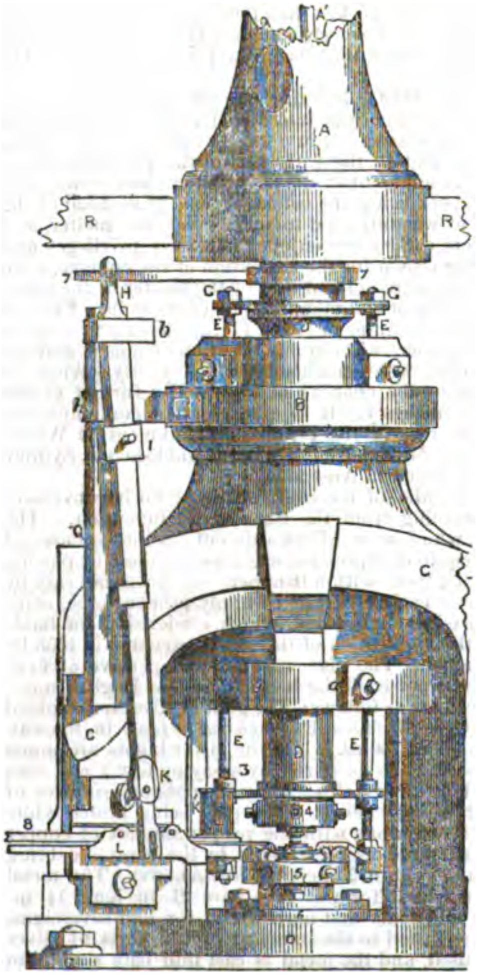
The new copper, or rather bronze coinage, issued in 1860, is an alloy consisting of 95 parts of copper, 4 of tin, and 1 of zinc. The coins are only about half the weight of their old copper representatives. The processes of casting and coining the bronze are essentially the same as in the case of gold and silver.

The operation of *rolling* follows that of casting. It consists in repeatedly passing the bars between pairs of rollers with hardened steel surfaces, driven by steam-power; the rollers being brought closer and closer as the thickness becomes reduced. At a certain stage, as the bars become longer, they are cut into several lengths; and to remove the hardness induced by the pressure they are annealed. The finishing rollers are so exquisitely adjusted that the *fillets* (as the thinned bars are called) do not vary in thickness in any part more than the ten-thousandth part of an inch. The slips are still further reduced in the British mint at what is called the "draw bench," where they are drawn between steel dies, as in wire-drawing, and are then exactly of the necessary thickness for the coin intended.

The fillets thus prepared are passed to the tryer, who, with a hand-punch, cuts a trial-blank from each, and weighs it in a balance; and if it vary more than ⅛th of a grain, the whole fillet is rejected.

For cutting out the *blanks* of which the coins are to be made, there are in the British mint 12 presses arranged in a circle, so that one wheel with driving cams, placed in the center, works the whole. The punches descend by pneumatic pressure, and the fillets are fed into the presses by boys, each punch cutting out about 60 blanks a minute. The scrap left after the blanks are cut out, called *scissel*, is sent back to be remelted.

Each blank is afterwards weighed by the automaton balance—a beautiful and most accurate instrument, which was added to the mint about 20 years ago. It weighs 23 blanks per minute, and each to the 0.01 of a grain. The standard weight of a sovereign is 123.274 grains, but the mint can issue them above or below this to the extent of 0.2568 of a grain, which is called *the remedy*. Blanks which come within this limit are dropped by the machine into a "medium" box, and pass on to be coined. Those below the required weight are pushed into another box to be remelted, but those above it into another, and are reduced by filing. The correct blanks are afterwards rung on a sounding iron, and those which do not give a clear sound are rejected as dumb.



Coining-Press.

To insure their being properly milled on the edge, the blanks are pressed edgeways in a machine between two circular steel-plates, which raises the edges, and at the same time secures their being perfectly round. After this they are annealed to soften them, before they can be struck with dies; they are also put into a boiling pot of dilute sulphuric acid, to remove any oxide of copper from the surface. Subsequently they are washed with water, and dried with great care in hot sawdust, and finally in an oven at a temperature slightly above boiling water. Without these precautions, the beautiful bloom upon new coin could not be secured.

We now come to the press room, where the blanks receive the impression which makes them perfect coins. The coining press is shown in the fig., and there are eight of them in all, ranged in a row upon a strong foundation of masonry. CCB is the massive iron frame into which the screw D works, the upper part B being perforated to receive it. On the bottom of this screw the upper steel die is fixed by a box, the lower die being fixed in another box attached to the base of the press. The dies have, of course, the obverse and reverse of the coin upon them. See Die sinking. The blank coin is placed on the lower die, and receives the impression when the screw is turned round so as to press the two dies forcibly towards each other. A steel ring or collar contains the coin while it is being stamped, which preserves its circular form, and also effects the milling on the edge. In cases where letters are put on the edge of a coin, a collar divided into segments working in center-pins, is used. On the proper pressure being applied, the segments close round, and impress the letters on the edge of the coin.

The screw of the press is put in motion by means of the piece A, which is worked by machinery driven by steam-power, and situated in an apartment above the coining-room. The steam-engine exhausts an air-chamber, and from the vacuum produced, an air-engine works a series of air-pumps, which communicate a more exact and regular motion to the machinery of the stamping presses than by the ordinary condensing engine. The loaded arms RR strike against blocks of wood, whereby they are prevented from moving too far, and run the risk of breaking the hard steel dies by bringing them in contact. The press brings down the die on the coin with a twisting motion, but if it were to rise up in the same way, it would abrade the coin; there is, in consequence, an arrangement which, by means of a wide notch in the ring 3, allows the die to be raised up a certain distance before it begins to turn round with the screw.

On the left side of the figure, the arrangement for feeding the blanks and removing the coins as they are stamped, is shown. A lever HIK, moving on a fulcrum I, is supported by a bar Q, fixed to the side of the press. The top of this lever is guided by a sector, 7, fixed upon the screw D. In this sector there is a spiral groove, which, as the screw turns round, moves the end H of the lever to or from the screw, the other end K being moved at the same time either towards or away from the center of the press. The lower end of the lever moves a slider L, which is directed exactly to the center of the press, and on a level with the upper surface of the die. The slider is a thin steel-plate in two pieces united by a joint, and having a circular cavity at the end, which, when its limbs are shut, grasps a piece of coin by the edge. This piece drops out on the limbs separating. There is a tube at K which an attendant keeps filled with blank pieces; it is open at the bottom, so that the pieces rest on the slider. When the press is screwed down, the slider is drawn back to its furthest extent, and its circular end comes exactly beneath the tube. A blank piece of coin now drops in, and is carried, when the screw rises, to the collar which fits over the lower die. The slider then returns for another blank, while the upper die descends to give the impression to the coin. Each time the slider brings a new blank to the die, it at the same time pushes off the piece last struck. An arrangement of springs lifts the milled collar to inclose the coin while it is being struck.

It is found on examining the coins that about 1 in 200 is imperfectly finished; these being rejected, the rest are finally weighed into bags, and subjected to the process of *pyxing*. This consists in taking from each bag a certain number of sovereigns or other coins, and subjecting them to a final examination by weight and assay, before they are delivered to the public.

MINT (*ante*). The first U. S. mint was established at Philadelphia by the coinage act of April 2, 1792; and the first production of the new mint was the copper cent of 1793. Silver dollars were first coined in 1794 and gold eagles in 1795. Branches of the Philadelphia mint were organized at New Orleans, Dahlonega, Ga., and Charlotte, N. C., in 1835; at San Francisco, Cal., in 1854, and at Carson City, Nev., in 1870. Those at New Orleans, Dahlonega, and Charlotte have been given up. Assay offices were set up at New York in 1854, at Denver in 1864, and Boise City, Idaho, in 1872. The act of April 1, 1873, put all the mints and assay offices on the same footing as a bureau of the treasury department, under the superintendence of the director of the mint, who is appointed by the president for a term of 5 years, and is under the supervision of the secretary of the treasury. The director of the Philadelphia mint, who had hitherto been called director of the mint, was now known as superintendent of the Philadelphia mint. Every mint has a superintendent, melter and refiner, assayer, and coiner, and the Philadelphia mint has an engraver, who supervises the manufacture of the dies used in all the U. S. mints. The total production of the mints for 1880 was: gold coin, $56,157,735.00; silver, $27,942,437.50; minor coins, $269,971.50. The present director of the mint (1881) is Horatio C. Burchard, of Illinois.

MINTO, Gilbert Elliot, Earl of, 1751–1814; entered the British parliament as a whig in 1774. He was minister to Denmark from 1788 to 1794, then went to Corsica as viceroy. On his return in 1797 he was created baron Minto, and two years later he became ambassador to Vienna. On his reappearance in the house of lords he became an advocate of the union of Ireland with England, and afterwards strenuously opposed Roman Catholic emancipation. He was governor-general of Bengal from 1807 to 1813, and in the latter year received the titles of earl Minto, viscount Melgund.

MINTURN, Robert Bowne, 1805–66: b. N. Y.; entered mercantile life at an early age in New York city, and became eventually a partner in the well known shipping house of Grinnell, Minturn & Co., in which he accumulated a large fortune. He was chiefly noted as an active promoter of the city's charities; as one of the founders of St. Luke's hospital; for patriotic service during a visit to Europe in 1861; and as an earnest worker in behalf of the freedmen. At the time of his death he was president of the Union League club of New York.

MINU'CIUS, Felix Marcus, an eminent apologist of the Latin church in the 3d century. He was a native of Africa, but removed to Rome, where he was a successful advocate until his conversion to Christianity. Jerome and Lactantius speak of him as much admired for his eloquence. He wrote a work entitled *Octavius* in the form of a dialogue between a Christian called Octavius and a heathen called Cæcilius. Octavius defends the Christians from the calumnies which were circulated against them, charging them with crimes in their secret religious meetings. He, on the other hand, exposes the licentious practices of the heathen. The style of the work is argumentative and pure, and much information is given concerning the manners, customs, and opinions of that period. As an apology for Christianity his work compares favorably with those of Justin, Tertullian, and other early advocates of the Christian faith, and with those of Lactantius, Ambrose, and Eusebius of the 4th century. It was at one time ascribed to Arnobius as a part of his treatise *Adversus Gentes;* but Baldwin in a *Dissertation on Minucius*, shows that Minucius was the author. It has passed through many editions at Leyden and Cambridge, Eng., the latter containing numerous notes by Dr. Davis, and a dissertation or commentary by Baldwin. It has been translated also into French and German.

MINUET, the air of a most graceful dance, originally from Poitou, in France. It is performed in a slow tempo. The first minuet is said to have been composed by Lully the elder, and was danced by Louis XIV. in 1653 at Versailles with his mistress. The music of the minuet is in $\frac{3}{4}$ time, and is still well known in England by the celebrated *minuet de la cour*, which is frequently introduced in stage performances.

MINUIT, MINUITS, or MINNEWIT, Peter, 1580–1641; b. Germany; a deacon in the Protestant or Walloon church in Wesel, who removed to Holland early in the 17th c., and after a residence there of some years received from the Dutch West India company the appointment of governor and director-general of New Netherland. He reached the seat of his government, Manhattan island, May 4, 1626, and proceeded to establish in permanency his tenure and that of the company by purchasing the island from the Indians, obtaining it for the sum of sixty guilders, about 24 dollars. He built fort Amsterdam, and defended the claim of the Dutch to rightful possession of the island with great courage and determination, while he administered the affairs of his office judiciously and to the general satisfaction of the colony, which advanced in power and prosperity. The fact that the patroons were successful in establishing titles to enormous tracts of land became objectionable to the Dutch West India company, who recognized the introduction of abuses in this course and placed the responsibility on the shoulders of gov. Minuit. In 1631 he was accordingly recalled by the company, and sailed for Holland in the following spring, but was driven into Plymouth, Eng., by a gale. Here a charge was set up against him of having prosecuted illegal trading within English dominions, and his vessel was attached on complaint made by the New England council. It required a protest from the ambassador of Holland in London to obtain the release of the vessel, and the discharge of the complaint; and this was not effected until the latter part of May. Minuit now made every effort to re-establish himself in the favor of the Dutch West India company, but without success, and at length offered his services to the government of Sweden for colonizing purposes. His proposition was favorably considered by the celebrated Oxenstiern, who was then chancellor, and through his influence a Swedish West India company was organized, and Minuit was commissioned by the queen to establish a Swedish colony in America. He accordingly gathered together sufficient Swedes and Finns for this purpose, and sailed for the port of Gothenburg, Sweden, in 1637, bound for the w. coast of Delaware bay, which point had been selected for the site of the new colony. He arrived in Chesapeake bay in the spring of 1638, and built fort Christiana, near where the city of Wilmington, Del., now stands. The Swedish colonization scheme was bitterly opposed by the Dutch, who threw every possible obstacle in the way of its success, and eventually captured the colony and annexed it to their possessions in 1655. But while it was under the direction of Minuit, during which time it was called New Sweden, the Dutch were unable to accomplish its absorption. Minuit died at fort Christiana.

MINUTE, a rough draft of any proceeding or instrument; so called from being taken down shortly and in *minute* or small writing, to be afterwards engrossed. See Engross.—Minute, in law, is a memorandum or record of some act of a court or of parties; in the latter sense, it is used chiefly in Scotland, as in the case of minute of agreement, minute of sale, etc.

MINUTE, the 60th part of an hour; also the 60th part of a degree of a circle. See Sexagesimal Arithmetic.—Minute, in architecture, is the 60th part of the diameter of the shaft of a classic column, measured at the base. It is used as a measure to determine the proportions of the order.

MI'OCENE (Gr. less recent), a term introduced by Lyell to characterize the middle tertiary strata, which he supposes to contain a smaller proportion of recent species of mollusca than the newer pliocene, and more than the older eocene. He estimates the proportion of living to fossil species in the miocene at 25 per cent.

Strata of this age occur in Britain in two limited and far separated localities—in the island of Mull, and at Dartmoor in the s.e. of England. In this last district, they exist at Bovey Tracey, in a flat area of 10 m. long by 2 m. broad, and consist of clay interstratified with beds of imperfect lignites. Pengelly and Heer have recently examined the strata of this small basin, and have found that all the plants are of miocene age, and belong to the same species as those found in similar deposits, not only on the continent, but in Iceland, Greenland, and Arctic America. Their *facies* indicates a warmer climate than the present, and the geographical range of the species is unexampled in the existing flora. The Mull beds are situated at the headland of Ardtun, and consist of interstratified basalts, ashes, and lignites. There are three leaf-beds, varying in thickness from 1½ to 2½ ft., separated by two beds of ash, the whole resting on and covered by strata of basalt. The whole thickness is 131 feet. It is supposed that the leaf-beds were deposited in a shallow lake or marsh, in the vicinity of an active volcano. One of the beds consists of a mass of compressed leaves without stems, and accompanied with abundant remains of an equisetum, which grew in the marsh into which the leaves were blown. The leaves belong to dicotyledons and coniferæ, and are of species similar to those of Bovey Tracey.

The Fahluns of France are of this age, as are also part of the Mollassi of Switzerland, and the Mayence and Vienna basins. Of the same period are the highly fossiliferous deposits in the Sewalik hills, India, containing the remains of several elephants, a mammoth, hippopotamus, giraffe, and large ostrich, besides several carnivora, monkeys, and crocodiles, and a large tortoise, whose shell measured 20 ft. across. The European beds contain the remains of the dinotherium (q.v.).

MIOHIPPUS. See HORSE, FOSSIL.

MIÖSEN, a lake in Norway, 36 m. n.e. of the city of Christiania, from which it may be reached by railroad. It is formed by the Lougen river, which empties into the lake at the little village of Lillehammer, and is 56 m. long and 12 m. in its greatest width. The scenery is very picturesque, and, as the climate of that part of Norway is most invigorating, the vicinity of the lake is very popular as a summer resort.

MIRABEAU, HONORÉ GABRIEL RIQUETTI, Comte de, was b. Mar. 9, 1749, at Bignon, near Nemours. He was descended, by his own account, from the ancient Florentine family of Arrighetti, who, being expelled from their native city in 1268, on account of Ghibelline politics, settled in Provence. Jean de Riquetti or Arrighetti purchased the estate of Mirabeau in 1562; his grandson, Thomas, happened to entertain here, in 1660, Louis XIV. and cardinal Mazarin, on which occasion he received from the monarch the title of marquis Victor Riquetti. Marquis de Mirabeau (b. 1715, d. 1789), the father of Honoré, was a vain and foolish man, wasted his patrimony, wrote books of philanthropy and philosophy, as *L'Ami des Hommes* (5 vols. Par. 1755), and was a cruel tyrant in his own house. He procured no fewer than 54 *lettres de cachet* at different times against his wife and his children. Honoré, his eldest son, was endowed with an athletic frame and extraordinary mental abilities, but was of a fiery temper, and disposed to every kind of excess. He became a lieut. in a cavalry regiment; but continued to prosecute various branches of study with great eagerness, whilst outrunning his companions in a career of vice. An intrigue with the youthful wife of an aged marquis brought him into danger, and he fled with her to Switzerland, and thence to Holland, where he subsisted by his pen, amongst other productions of which his *Essai sur le Despotisme* attracted great attention. Meanwhile, sentence of death was pronounced against him; and the French minister, at his father's instigation, demanding that he should be delivered up to justice, he and his paramour were apprehended at Amsterdam, and he was brought to the dungeon at Vincennes, and there closely imprisoned for 42 months. During this time he was often in great want, but employed himself in literary labors, writing an *Essai sur les Lettres de Cachet et les Prisons d'état*, which was published at Hamburg (2 vols. 1782), and a number of obscene tales, by which he disgraced his genius, although their sale supplied his necessities. After his liberation from prison, he subsisted chiefly by literary labor, and still led a very profligate life. He wrote many effective political pamphlets, particularly against the financial administration of Calonne, receiving pecuniary assistance, it was said, from some of the great bankers of Paris; and became one of the leaders of the liberal party. When the states-general were convened, he sought to be elected as a representative of the nobles of Provence, but was rejected by them on the ground of his want of property; and left them with the threat that, like Marius, he would overthrow the aristocracy. He purchased a draper's shop, offered himself as a candidate to the third estate, and was enthusiastically returned both at Aix and Marseilles. He chose to represent Marseilles, and by his talents and admirable oratorical powers soon acquired great influence in the states-general and national assembly. Barnave well characterized him as "the Shakespeare of eloquence." He stood forth as the opponent of the court and of the aristocracy, but regarded the country as by no means ripe for the extreme changes proposed by political theorists, and labored, not for the overthrow of the monarchy, but for the abolition of despotism, and the establishment of a constitutional throne. To suppress insurrection he effected, on July 8, 1789, the institution of the national guard. In some of the contests which followed, he sacrificed his popularity to maintain the throne. The more that anarchy and revolutionary frenzy prevailed, the more decided did he become in his resistance to their progress; but it was not easy to maintain the cause of constitutional liberty at once against the supporters of the ancient despotism and the extreme revolutionists. The king and his friends were long unwilling to enter into any relations with one so disreputable, but at last, under the pressure of necessity, it was resolved that Mirabeau should be invited to become minister. No sooner was this known than a combination of the most opposite parties, by a decree of Nov. 7, 1789, forbade the appointment of a deputy as minister. From this time forth Mirabeau strove in vain in favor of the most indispensable prerogatives of the crown, and in so doing exposed himself to popular indignation. He still continued the struggle, however, with wonderful ability, and sought to reconcile the court and the revolution. In Dec., 1790, he was elected president of the club of the Jacobins, and in Feb., 1791, of the national assembly. Both in the club and in the assembly he displayed great boldness and energy; but soon after his appointment as president of the latter, he sank into a state of bodily and mental weakness, consequent upon his great exertions and his continued debaucheries, and died April 2, 1791. He was interred with great pomp in the church of St. Genevieve, the "Pantheon;" but his body was afterwards removed to make room for that of Marat. A complete edition of his works was published at Paris in 9 vols. in 1825–27. His natural son, Lucas Montigny, published *Mémoires Biographiques, Littéraires et Politiques de Mirabeau* (2d edit. 8 vols. Par. 1841), the most complete account which we have of his life. See also Carlyle's sketch of Mirabeau in his *Miscellaneous Essays* and his *French Revolution.*

MIRACLE, a term commonly applied to certain marvelous works (healing the sick, raising the dead, changing of water into wine, etc.), ascribed in the Bible to some of the ancient prophets, and to Jesus Christ, and one or two of his followers. It signifies simply that which is wonderful—a thing or a deed to be wondered at, being derived directly from the Latin *miraculum*, a thing unusual—an object of wonder or surprise. The same meaning is the governing idea in the term applied in the New Testament to the Christian miracles, *teras*, a marvel, a portent; besides which, we also find them designated *dunameis*, powers, with a reference to the power residing in the miracle-worker; and *sēmeia*, signs, with a reference to the character or pretensions of which they were assumed to be the witnesses or guarantees. Under these different names, the one fact recognized is a deed done by a man, and acknowledged by the common judgment of men to exceed man's ordinary powers; in other words, a deed *supernatural*, above or beyond the common powers of nature, as these are understood by men.

In the older speculations on the subject, a miracle was generally defined to be a violation or suspension of the order of nature. While, on the one hand, it was argued (as by Hume) that such a violation or suspension was absolutely impossible and incredible; it was maintained, on the other, that the Almighty, either by his own immediate agency, or by the agency of others, could interfere with the operation of the laws of nature, in order to secure certain ends, which, without that interference, could not have been secured, and that there was nothing incredible in the idea of a law being suspended by the person by whom it had been made. The laws of nature and the will or providence of God were, in this view, thus placed in a certain aspect of opposition to each other, at points here and there clashing, and the stronger arbitrarily asserting its superiority. Such a view has, with the advance of philosophical opinion, appeared to many to be inadequate as a theory, and to give an unworthy conception of the divine character. The great principle of law, as the highest conception not only of nature but of divine Providence, in all its manifestations, has asserted itself more dominantly in the realm of thought, and led to the rejection of the apparently conflicting idea of "interference" implied in the old notion of miracle. Order in nature, and a just and uncapricious will in God, were felt to be first and absolutely necessary principles. The idea of miracle, accordingly, which seems to be now most readily accepted by the advocates of the Christian religion, has its root in this recognized necessity.

All law is regarded as the expression, not of a lifeless force, but of a perfectly wise and just will. All law must develop itself through natural phenomena; but it is not identified with or bound down to any necessary series of these. If we admit the mainspring of the universe to be a living will, then we may admit that the phenomena through which that will, acting in the form of law, expresses itself, may vary without the will varying or the law being broken. We know absolutely nothing of the mode of operation in any recorded miracle; we only see certain results. To affirm that these results are either impossible in themselves, or necessarily violations of natural law, is to pronounce a judgment on imperfect data. We can only say that, under an impulse which we must believe proceeds from the divine will, in which all law exists, the phenomena which we have been accustomed to expect have not followed on their ordinary conditions. But from our point of view we cannot affirm that the question as to *how* this happens is one of interference or violation; it is rather, probably, one of higher and lower action. The miracle may be but the expression of one divine order and beneficent will in a new shape—the law of a greater freedom, to use the words of Trench, swallowing up the law of a lesser.

Nature being but the plastic medium through which God's will is ever manifested to us, and the design of that will being, as it necessarily must be, the good of his creatures, that theory of miracle is certainly most rational which does not represent the ideas of laws, and of the will of God as separate and opposing forces, but which represents the divine will as working out its highest moral ends, not against, but through law and order, and evolving from these a new issue, when it has a special beneficent purpose to serve. And thus, too, we are enabled to see in miracle not only a wonder and a power, but a sign —a revelation of divine character, never arbitrary, always generous and loving, the character of one who seeks through all the ordinary courses of nature and operation of law to further His creatures' good, and whose will, when that end is to be served, is not restricted to any one necessary mode or order of expression. Rightly interpreted, miracle is not the mere assertion of power, or a mere device to impress an impressible mind; it is the revelation of a will which, while leaving nature as a whole to its established course, can yet witness to itself as above nature, when, by doing so, it can help man's moral and spiritual being to grow into a higher perfection.

The evidence for the Christian miracles is of a twofold kind—external and internal. As alleged facts, they are supposed to rest upon competent testimony, the testimony of eye-witnesses, who were neither deceived themselves, nor had any motive to deceive others. They occurred not in privacy, like the alleged supernatural visions of Mohammed, but for the most part in the open light of day, amidst the professed enemies of Christ. They were not isolated facts; nor wrought tentatively, or with difficulty; but the repeated, the overflowing expression, as it were, of an apparently supernatural life. It seems impossible to conceive, therefore, that the apostles could have been deceived as to their character. They had all the means of scrutinizing and forming a judgment regarding them that they could well have possessed; and if not deceived themselves, they were certainly not deceivers. There is no historical criticism that would now maintain such a theory; even the most positive unbelief has rejected it. The career of the apostles forms throughout an irrefragable proof of the deep-hearted and incorruptible sincerity that animated them. The gospel miracles, moreover, are supposed in themselves to be of an obviously divine character. They are, in the main, miracles of healing, of beneficence, in which the light equally of the divine majesty and of the divine love shines—witnessing to the eternal life which underlies all the manifestations of decay, and all the traces of sorrow in the lower world, and lifting the mind directly to the contemplation of his life.

MIRACLE PLAYS. See MYSTERIES.

MIRACLES, ECCLESIASTICAL. The position of the reformed churches generally with regard to miracles is that they ceased in the church after the apostolic age, while the Romanists contend that the power to perform miracles has remained with the church and will continue forever. The arguments of the reformed are that when the work of the apostles was finished the necessity for miracles ceased, and that during the first hundred years after the death of the apostles we hear little or nothing of the early Christians working miracles. Bishop Douglas says: "I can find no instances of miracles mentioned by the fathers before the 4th century." In the 4th c. they speak of the age of miracles as past, and say that they were no longer to be expected. This is frequently asserted by Augustine, and Chrysostom testifies the same in his sermons on the resurrection and the feast of pentecost. And even when they relate remarkable deeds performed by Christian believers, and which the Roman Catholics pronounce miraculous, they declare them to be *natural* results. Bishop Douglas says that these wonderful workings were confined to "the cures of diseases, particularly the cures of demoniacs, by exorcising them; which last seems, indeed, to be their favorite standing miracle." Even prof. Newman, contrasting the scriptural and ecclesiastical miracles, says: "The miracles of Scripture are, as a whole, grave, simple, and majestic; those of ecclesiastical history often partake of what may not unfitly be called a romantic character, and of that wildness and inequality which enters into the notion of romance." Yet Butler says: "Roman Catholics, relying with confidence on the promises of Christ, believe that the power of working miracles was given by Christ to his church, and that it never has been and never will be withdrawn from her." And Bellarmine argues that the Protestant church, lacking this power, is manifestly not of God. Romanists refer to what Ignatius, of the 1st c. after Christ, relates of the wild beasts let loose upon the martyrs being restrained from hurting them, and to the miracle which prevented the apostate Julian from rebuilding the temple of Jerusalem. As to the first, Ignatius regarded the occurrence as wholly in the line of natural events. It is important to notice the fact that the writings of the ante-Nicene church are more free from miraculous and superstitious elements than the records of the middle ages, and especially of monasticism. Dr. Isaac Taylor remarks: "From the period of the Nicene council and onward, miracles of the most astounding kind were alleged to be wrought from day to day. But these miracles were, in *almost every instance*, wrought expressly in support of those very practices and opinions which stand forward as the points of contrast distinguishing Romanism from Protestantism, as the ascetic life, the supernatural properties of the eucharistic elements, the invocation of the saints, and the efficacy of their relics, and the reverence or worship due to certain visible and palpable religious symbols." Dr. Schaff makes the following remarks concerning the miracles of the Latin church: 1. Many of them have a much lower tone than those of the Bible, making a stronger appeal to our faculty of belief. 2. They serve not to confirm the Christian faith in general, but to support the ascetic life and many superstitious practices. 3. The farther removed from the apostolic age the more numerous they are. 4. Most of the church fathers allowed falsehood for the glory of God. 5. Several church fathers concede that in their time extensive frauds with the relics of saints were already practiced. 6. The Nicene miracles were doubted and contradicted even among contemporaries. 7. The church fathers contradict themselves sometimes respecting the prevalent faith in miracles, and again maintaining that miracles in the biblical sense had long since ceased. Yet Dr. Schaff remarks that a rejection of these miracles by no means charges intentional deception in every case, for between the proper miracle and fraud there are many intermediate steps of self-deception: clairvoyance, magnetic phenomena and cures, and unusual states of the human soul, which is full of deep mysteries. Constantine's vision of the cross, for example, may be traced to a prophetic dream, and the frustration of Julian's attempt to build the Jewish temple to a special providence or a natural historical judgment of God. A conclusive argument against many, at least, of these so-called miracles is that they are trifling and childish; others indecorous; others irreverent, and even blasphemous. Those contained in the Breviary and Roman ecclesiastical histories are too numerous to recite. Finally, it may be said that many distinguished Roman Catholic authors do not accept these as genuine miracles; even pope Gregory XI., who had been persuaded by the prophecies of St. Catharine of Sienna to return to Rome from Avignon, warning all on his death-bed to beware of human beings, whether male or female, speaking under pretense of religion the visions of their own brain, for by these, he said, he had been led away.

MIRACULOUS CONCEPTION, The, denotes the supernatural formation of the bodily human nature of Jesus Christ from the substance of the Virgin Mary by the operation of the Holy Ghost. The proof by which this central article of Christianity is established was furnished, before the conception took place, by divine revelation to Mary herself and afterwards to Joseph her espoused husband. It is implied also by several particular declarations of Scripture and by its general teaching concerning the incarnate Son of God. It is the point from which is dated by most of the Christian theologians the union of the divine and human natures in the person of the Redeemer; and it gives completeness and consistency to the revelation concerning him. It exalts even his human nature by its immediately divine origin above that of the race to whom he was in all respects made like, yet without sin; and gives the necessary basis for the innumerable implications of the New Testament that his personal relation to the Father was unique in kind as well as degree. As a miracle, it accords with and is no more amazing than the miracle of his character. See Incarnation; Jesus Christ.

MIRAFLORES, Manuel De Pando, Marquis of, and count of Villapaterna, 1792-1872, b. Madrid. He was sent as ambassador to London in 1834, and to Paris in 1838. In 1846 he was president of the council of ministers, and filled the same office in 1863. He was ambassador to Vienna in 1861, and several times president of the senate. He wrote a number of works which are of value for the political history of Spain during the last fifty years. The most important is *Memoirs for the history of the first seven years of the Reign of Isabel II.*

MIRAGE', a phenomenon extremely common in certain localities, and as simple in its origin as astonishing in its effects. Under it are classed the appearance of distant objects as double, or as if suspended in the air, erect or inverted, etc. One cause of mirage is a diminution of the density of the air near the surface of the earth, produced by the transmission of heat from the earth, or in some other way; the denser stratum being thus placed *above*, instead of, as is usually the case, *below* the rarer. Now, rays of light from a distant object, situated in the denser medium (i. e., a little above the earth's level), coming in a direction nearly parallel to the earth's surface, meet the rarer medium at a very obtuse angle, and (see Refraction) instead of passing into it, are reflected back to the dense medium, the common surface of the two media acting as a mirror. Suppose, then, a spectator to be situated on an eminence, and looking at an object situated like himself in the denser stratum of air, he will see the object by means of directly transmitted rays; but besides this, rays from the object will be reflected from the upper surface of the rarer stratum of air beneath to his eye. The image produced by the reflected rays will appear inverted, and below the real object, just as an image reflected in water appears when observed from a distance. If the object is a cloud or portion of sky, it will appear by the reflected rays as lying on the surface of the earth, and bearing a strong resemblance to a sheet of water; also, as the reflecting surface is irregular, and constantly varies its position, owing to the constant communication of heat to the upper stratum, the reflected image will be constantly varying, and will present the appearance of a water surface ruffled by the wind. This form of mirage, which even experienced travelers have found to be completely deceptive, is of common occurrence in the arid deserts of lower Egypt, Persia, Tartary, etc.

In particular states of the atmosphere, reflection of a portion only of the rays takes place at the surface of the dense medium, and thus double images are formed, one by reflection, and the other by refraction—the first inverted, and the second erect. The phenomena of mirage are frequently much more strange and complicated, the images being often much distorted and magnified, and in some instances occurring at a considerable distance from the object, as in the case of a tower or church seen over the sea, or a vessel over dry land, etc. The particular form of mirage known as *looming* is very frequently observed at sea, and consists in an excessive apparent elevation of the object. A most remarkable case of this sort occurred on July 26, 1798, at Hastings. From this place the French coast is fifty miles distant; yet, from the sea-side the whole coast of France from Calais to near Dieppe was distinctly visible, and continued so for three hours. In the Arctic regions it is no uncommon occurrence for whale-fishers to discover the proximity of other ships by means of their images seen elevated in the air, though the ships themselves may be below the horizon. Generally, when the ship is above the horizon, only one image, and that inverted, is found; but when it is wholly or in great part below the horizon, double images, one erect and the other inverted, are frequently seen. The faithfulness and distinctness of these images at times may be imagined from the fact, that capt. Scoresby, while cruising off the coast of Greenland in 1822, discovered the propinquity of his father's ship from its inverted image in the sky. Another remarkable instance of mirage occurred in May, 1854, when, from the deck of H. M. screw-steamer *Archer*, then cruising off Oesel, in the Baltic, the whole English fleet of nineteen sail, then nearly thirty miles distant, was seen as if suspended in the air upside down. Besides such phenomena as these, the celebrated *Fata Morgana* (q.v.) of the straits of Messina sinks into insignificance. The *Specter of the Brocken*, in Hanover, is another celebrated instance of mirage. Its varieties are indeed numberless, and we refer those who wish for further information to Brewster's *Optics*, Biot's *Traité de Physique*, and for the mathematical theory of the mirage to the works of Biot, Monge, and Wollaston. See also REFLECTION and REFRACTION.

MIRAMICHI' RIVER, the second largest river in New Brunswick. It is formed by the junction of its two branches, the n.w. and s.w. Miramichi. It flows, after a course of about 100 m., into the bay of Miramichi, a part of the gulf of St. Lawrence. Pine woods line the banks of the river, which is navigable for vessels of moderate size for a distance of 40 m. from its mouth.

MIR'AMON, MIGUEL, 1832–67; b. Mexico, of French extraction. He was educated at the military academy at Chepultepec, near the city of Mexico, and was one of the defenders of that stronghold against the American assault, Sept. 8, 1847, being wounded and taken prisoner. At the end of the war he was released, and filled his term in the academy. In 1852 he was regularly enlisted in the Mexican army, and two years later had gained the rank of capt. He was distinguished in several revolutionary engagements, and was promoted to be a col. in 1855. The existing political situation becoming reversed, and Alvarez being president, Miramon found his position in the army a very delicate one. Being sent on an expedition against the enemies of the new government, he rebelled on his own account, and turned his force over to the revolutionists, whom he commanded in a successful attack on Puebla. That city being besieged by order of Alvarez, Miramon defended it with remarkable skill and spirit on two occasions. It capitulated to an overpowering force in the latter part of 1856, and Miramon, having escaped, conducted an independent fight until he was wounded and captured in the following year. He succeeded in obtaining his release, and continued to resist the government until Comonfort, who had succeeded Alvarez, retired from the presidency. The struggle now began which has passed into Mexican history as the "war of reform," in which Miramon was conspicuous on the side and at the head of the church party. Zuloaga had already succeeded Comonfort in the presidency, and on a new election Miramon was named as his successor, but declined. On the retirement of Zuloaga, however, he was appointed president *pro tem.*, when at the head of the army he continued the war against the liberals and Juarez. He was concerned in, and partly responsible for, the miserable massacre of Tacubaya in 1859. In the latter part of 1860 the liberals were successful, and Miramon fled the country. He traveled in Europe until the French intervention and the accession of Maximilian as emperor, when he received a diplomatic position abroad. In 1866 he returned to Mexico, and, with Marquez, was placed in command of Maximilian's army. He was captured May 15, 1867, and, with the emperor and gen. Mejia, was shot June 19.

MIRANDA, FRANCISCO, about 1750–1816; b. Caraccas, South America. He accompanied the French forces in their campaign in aid of American independence, then returned to South America and attracted attention by endeavoring to incite a revolution among the Spanish troops over whom he was col. He was compelled to flee, however, and next traveled in Europe, where he obtained the friendship particularly of the Russian empress Catherine II., William Pitt, and leaders in the French revolution. While in Paris, in 1790, the Girondists appointed him a maj.gen., and he attended Dumouriez in his campaign against the Prussians. Though he was a skillful commander, the forces under his command met with little success; and a defeat at Neerwinden was attributed to his treachery, a suspicion that caused his arraignment before the revolutionary tribunal. After the fall of the Girondists he was threatened with transportation, and fled to England. In 1803 Napoleon banished him again, and he visited New York, where he obtained assistance in a second attempt to overthrow the power of Spain in South America. Two vessels were fitted out for him, and he sailed for South America in 1806. But the undertaking came to nothing, and it was not until 1810 that he succeeded in gaining a triumph, and compelled the subjugation of Valentia, Puerto Cabello, and nearly the whole of New Granada. This lasted a year. The Spanish monarchy then gained the ascendency; Miranda was forced to surrender; and, in violation of the conditions, he was sent to Spain, where he died in the dungeons of the inquisition.

MIRANDOLA, a t. of northern Italy, in the province of Modena, and 20 m. n.n.e. of the city of that name. It stands in the midst of a low-lying and somewhat unhealthy flat, and contains numerous churches, a cathedral, and a citadel. Rice is much cultivated in the vicinity, and the breeding of silk-worms is an important branch of industry. Pop. of town, '71, 3,059; of commune, 13,170.

MIRANDOLA, PICO DELLA. See PICO, GIOVANNI DELLA MIRANDOLA, *ante.*

MIRBEL, LUZINSKA AIMÉE ZOÉ RUE, 1796–1849; b. at Cherbourg, France. Most of her life was spent in Paris, where she married in 1820 the celebrated naturalist, Charles François Brisseau Mirbel, and won a high reputation as a miniature and portrait painter.

MIRECOURT, a t. of France in the department of Vosges, in a picturesque district, 20 m. s. of Nancy. It is famous for its manufactures of lace, and of church organs and stringed musical instruments. Pop. '76, 5,162.

MIRÈS, JULES, 1809–71; b. in Bordeaux, of Jewish parentage. He opened in Paris as a broker, became director in a gas company, and in 1848 purchased the *Journal des Chemins de Fer* in company with Moïse Millaud. They afterwards purchased the *Conseiller du Peuple*, the *Constitutionnel*, and other journals; then founded the *Caisse des Chemins de Fer*, or railway bank, and, by means of all these agencies skillfully employed, acquired great fortunes. In 1860 Mirès negotiated a Turkish loan. In 1861 he was arrested for fraud and condemned to five years' imprisonment and a fine. Appealing from the first decision to the imperial court the judgment was confirmed; the court of cassation set it aside; but on a second trial before the same court the judgment was finally affirmed, and Mirès served in the penitentiary till 1866, when he returned to Paris, resumed banking, and published *Un Crime Judicière.*

MIRFIELD, a manufacturing village of the West Riding of Yorkshire, England, three m. e. of Dewsbury. The manufactures are fancy and other woolen fabrics, and cotton goods. It is one of the chief railway centers in the country. Pop. '71, 12,869.

MIRIAM (Gr. *Mariam*, Lat. *Maria*, Eng. *Mary*), the sister of Moses, the leader and lawgiver of the Hebrews. She is presumed to be the sister who watched him when an infant concealed in a basket on the banks of the Nile. On occasion of the deliverance of Israel from Pharaoh and his host at the Red sea, she led the Israelitish women forth with music, taking up in response the song of Moses, and enjoining her followers to "Sing to the Lord." She is styled Miriam the prophetess, and in the book of Micah is classed with Moses and Aaron in the words, "I sent before thee Moses, Aaron, and Miriam." She seems, however, to have been the instigator as well as a sharer in the rebellion of Aaron against Moses on occasion of the coming of Moses's wife to the camp, as the whole punishment was visited upon her. She died, and was buried in the first month after the 40th year of the Exodus, at Kadesh-barnea, where her sepulcher was still shown in the time of Eusebius.

MIRKHOND', 1433–98; b. Persia; the author of a voluminous work relating to Persian history, entitled *Garden of Purity in the History of the Prophets, Kings, and Caliphs,* of which there are manuscripts in the libraries of London, Paris, Berlin, and Vienna. Besides the fragments in Wilkins's Persian grammar, portions of the work have been published in Persian and Latin in *The History of the Persian Kings,* by the German scholar Jenisch; also, in Silvestre de Sacy's *Mémoires sur diverses Antiquities de la Perse,* in Jourdain's *Notice de l'Histoire Universelle de Mirkhond,* and in English by David Shea under the title of *History of the Early Kings of Persia* (London, 1832).

MIRPUR', a flourishing t. of India, in Sinde, on the left bank of the Piniari, 45 m. s. of Hyderabad. It contains a fort capable of accommodating 200 men, and which commands the route from Hyderabad to Cutch. The surrounding district is fertile and well cultivated. Pop. 3,000.

MIRROR, a reflecting surface, usually made of glass, lined at the back with a brilliant metal, so as strongly to reflect the image of any object placed before it. When mirrors were invented is not known, but the use of a reflecting surface would become apparent to the first person who saw his own image reflected from water; and probably for ages after the civilization of man commenced, the still waters of ponds and lakes were the only mirrors; but we read in the Pentateuch of mirrors of brass being used by the Hebrews. Mirrors of bronze were in very common use among the ancient Egyptians, Greeks, and Romans, of which many specimens are preserved in museums. Praxiteles taught the use of silver in the manufacture of mirrors in the year 328 B.C. Mirrors of glass were first made at Venice in 1300; and judging from those still in existence—of which one may be seen at Holyrood palace, in the apartments of queen Mary—they were very rude contrivances, compared with modern ones. It was not until 1673 that the making of mirrors was introduced into England. It is now a very important manufacture; and mirrors can be produced of any size to which plate glass can be cast. After the plate of glass is polished on both sides, it is laid on a perfectly level table of great strength and solidity, usually of smooth stone, made like a billiard table, with raised edges; a sheet or sheets of tin foil sufficient to cover the upper surface of the glass are then put on, and rubbed down smooth, after which the whole is covered with quicksilver, which immediately forms an amalgam with the tin. The superfluous mercury is then run off, and a woolen cloth is spread over the whole surface, and square iron weights are applied. After this pressure has been continued a day and night, the weights and the cloth are removed, and the glass is removed to another table of wood, with a movable top, which admits of gradually increasing inclination until the unamalgamated quicksilver has perfectly drained away, and only the surface of perfect amalgam remains coating the glass, and perfectly adherent to it.

Heat is reflected like light; so that a concave mirror may be used to bring rays of heat to a focus. In this way combustible substances may be set on fire at a distance from the reflector whence they receive their heat. Thus used, a mirror is called a *burning-mirror*.

MIRTA, a t. of India, in the Rajpoot state of Jodhpur, stands on high ground, near the source of a tributary of the Luni, 230 m. s.w. of Delhi. Mirta is supplied with good water from three large tanks. Pop. estimated at 25,950.

MIRZA, a contraction of *Emir Zadah*, "son of the prince," is, when *prefixed* to the surname of the individual, the common title of honor among the Persians; but when *annexed* to the surname, it designates a prince or a male of the blood-royal.

MIRZAPUR, a t. of British India, capital of the district of the same name, on the right bank of the Ganges, which is here half a mile wide, and crossed by a ferry, 40 m. s.w. of Benares. It has some manufactures of carpets, cottons, and silks, and is the greatest cotton-mart in India. Pop. '72, 67,274. The *district* of Mirzapur, in the *North-west Provinces*, is watered by the Ganges and the Sone. Lat. 23° 50' to 25° 30' n.; long. 82° 11' to 83° 39' e. Area, 5,235 sq. miles. Pop. '72, almost all Hindus, 1,054,418. The chief productions, besides the usual cereals, are cotton, indigo, and sugar. The climate is, on the whole, unhealthy for Europeans.

MISDEMEA'NOR is one of the technical divisions of crimes, by the law of England and Ireland. The usual division of crimes is into treason (which generally stands by itself, though, strictly speaking, included in), felony, and misdemeanor. The offense of greatest enormity is treason, and the least is misdemeanor. The original distinction between felony and misdemeanor consisted in the consequences of a conviction. A party convicted of felony, if capital, forfeits both his real and personal estate; if not capital, his personal estate only. A party convicted of misdemeanor forfeits none of his property. The distinction is not kept up between the two classes of crimes by any greater severity of punishment in felony, for many misdemeanors are punished as severely as some felonies. But it has been the practice of the legislature, when creating new offenses, to say whether they are to be classed with felony or misdemeanor; and when this is done, the above incidents attach to the conviction accordingly.

MISDEMEANOR (*ante*), in the United States, is such a criminal act under common law or statute as is not included in common law or statutory felonies and is not treason. The term does not include, in its legal application, offenses against police regulations, city by-laws, and the like, though in common language it may extend to any misbehavior. It is evident that what is a statute-felony in one state may be a misdemeanor in another, and it is therefore impossible to give a complete classification of such offenses. They may be crimes against public justice, peace, health, or trade; against personal or property rights of individuals; or may be mere attempts and solicitations. Bouvier defines the word as applied to "all those crimes and offenses for which the law has not provided a particular name. Sometimes, but in this country rarely, the term *misprision* is used to include all higher classes of misdemeanor. Misdemeanor may be punished by trial brought either after indictment or information—that is, presentation by either a grand jury or a public prosecutor; and in most states the rule prevails that where felony is charged in the indictment but the evidence proves only an offense amounting to misdemeanor, conviction may be had of the latter.

In some states it is provided that upon acknowledgment of satisfaction by the injured party, in such cases as assault and battery or malicious mischief, the criminal procedure shall, with the consent of the magistrate, be dropped; a course which, obviously, would be improper in dealing with felonies.

MISE'NO, a promontory of the province of Naples, 9 m. s.w. of the city of Naples. On the outskirts of the promontory are the extensive ruins of the ancient city of Misenum, including a vast church and theater. Miseno is much visited on account of its wonderful grotto Draconara, and a curious subterranean building or labyrinth, called the Hundred Chambers, supposed to have been anciently employed as dungeons.

MISERE'RE, the name by which, in Catholic usage, the 50th psalm of the Vulgate (51st in authorized version) is commonly known. It is one of the so-called "Penitential Psalms," and is commonly understood to have been composed by David in the depth of his remorse for the double crime which the prophet Nathan rebuked in the well-known parable (2 Sam. xii.). Another opinion, however, attributes this psalm to Manasses, or to some of the psalm-writers of the captivity. The Miseré is of frequent occurrence in the services of the Roman church; and in the celebrated service of Tenebræ, as performed in the Sixtine chapel at Rome, it forms, as chanted by the pope's choir, one of the most striking and impressive chants in the entire range of sacred music. It is sung on each of the three nights in holy week (q.v.) on which the office of Tenebræ is held, with different music on each of the three occasions, the three composers being Bai, Baini, and the still more celebrated Allegri.—Miserere is also the name of one of the evening services in Lent, which is so called from the singing of that psalm, and which includes a sermon, commonly on the duty of sorrow for sin.

MISERERE, a projection on the under side of the seats of the stalls of mediæval churches and chapels, etc. They are usually ornamented with carved work, and are so shaped that when the seats proper are folded up, they form a small seat at a higher level, sufficient to afford some support to a person resting upon it. Aged and infirm ecclesiastics were allowed to use these during long services.

MISFEA'SANCE, in legal language, means the doing of a positive wrong, in contradistinction to nonfeasance, which means a mere omission. Acts are sometimes followed with different legal consequences, according as they fall under the head of misfeasance or nonfeasance.

MISHAWA'KA, a village in n. Indiana, a part of the township of Penn, on the s. bank of the St. Joseph river, navigable to this place, and furnishing good water-power; pop. '70, 2,617. It is 4 m. e. of South Bend, and 11 m. w. of Elkhart, and has a station on the Northwestern Grand Trunk railway, and the Lake Shore and Michigan Southern. It has excellent public schools, 7 churches, 1 bank, water-works, and important industries, comprising the manufacture of flour, axes, refrigerators, wind-mills, pumps, brushes, furniture, agricultural implements, etc., and a variety of stores.

MISH'MEE BITTER, the root of *Coptis teeta* (see Coptis), a plant found in the mountainous regions on the borders of India and China; of the same genus with the golden thread of the northern parts of the world, and not unlike it. The root is in much use and esteem in some parts of the east as a stomachic and tonic, and has begun to be known in Europe.—The root of *C. trifoliata* is also used as a bitter.

MISHNA (from Heb. *shana*, to learn; erroneously held to designate repetition) comprises the body of the "oral law," or the juridico-political, civil, and religious code of the Jews; and forms, as such, a kind of complement to the Mosaic or written law, which it explains, amplifies, and immutably fixes. It was not, however, the sole authority of the schools and the masters on which these explanations and the new ordinances to which they gave rise depended, but rather certain distinct and well-authenticated traditions, traced to Mount Sinai itself. No less were certain special letters and signs in the written law appealed to in some cases, as containing an indication to the special, newly issued, or fixed prohibitions or rules. See Halacha. The Mishna (to which the Toseftas and Boraithas form supplements) was finally redacted, after some earlier incomplete collections, by Jehudah Hanassi, in 220 A.D., at Tiberias. It is mostly written in pure Hebrew, and is divided into six portions (Sedarim): 1. Zeraim (Seeds), on Agriculture; 2. Moed (Feast), on the Sabbath, Festivals, and Fasts; 3. Nashim (Women), on Marriage, Divorce, etc. (embracing also the laws on the Naziriship and vows); 4. Nezikin (Damages), chiefly civil and penal law (also containing the ethical treatise Aboth); 5. Kadashim (Sacred Things), Sacrifices, etc.; description of the Temple of Jerusalem, etc.; 6. Tehoroth (Purifications), on pure and impure things and persons. See also Talmud.

MISILME'RI (corrupted from *Menzil-al-Amir*, village of the Emirs), a t. of the island of Sicily, in the province of Palermo, 7 m. s.e. of Palermo city. It is a straggling, poverty-stricken town. It was at Misilmeri that Garibaldi, in May, 1860, joined the Sicilian insurgents; and it was by a short cut from Misilmeri to Palermo, through the pass of Mezzagna, that he advanced on the latter city and took it by a *coup de main*. Misilmeri used to be a notorious harbor of banditti. Pop. 7,250.

MISKOLCZ', the principal t. in the co. of Borsod, Hungary, situated at the extremity of a beautiful valley, 25 m. n.e. of Erlau. It is connected with Debreczin by railway, and contains numerous churches, two gymnasia, and other educational institutions. Wine and melons are extensively cultivated. From the iron obtained in the vicinity, the best steel in Hungary is made. The chief trade is in wine. Pop. '70, 21,119.

MISNIA. See Meissen, *ante*.

MISNO'MER is the giving of a wrong name to a party in a suit. Formerly the objection of misnomer was of some importance, but now is of none, as it is easily cured by amendment.

MISNOMER, an instance of erroneous or erratic nomenclature, often proceeding on the *lucus a non lucendo* principle, as in the case of the so-called "German silver," which is not silver, was not invented or discovered by a German, and was in use in China ages ago. Among the large number of expressions which may be called misnomers the following are in common use in the English language: Black-lead, which is compounded of carbon and iron; blind-worms, which are not blind; Brazilian grass, which is not grass, but strips of palm-leaf, and comes from Cuba and not Brazil; Burgundy pitch is not pitch, but is prepared from frankincense and comes from Hamburg; catgut is the gut of sheep, instead of cats; china, applied to porcelain, whether English, French, or of other countries; cuttle-bone, which is not bone, but a chalky deposit contained in a sac occurring in the body of the cuttle-fish; Cleopatra's needle, which was erected by Rameses the great, and had no reference to Cleopatra; Dutch clocks, made in Germany instead of Holland; galvanized iron is not galvanized, but coated with zinc in a bath of muriatic acid; Gothic architecture was not the architecture of the Goths, but originated in England and France at a period prior to the renaissance; Indians (North American), applied to the aborigines of America by the early voyagers, who supposed that country to be a part of India; Irish stew, a dish unknown in Ireland; lacquer, which is made not from lac, but from a resin obtained from a nut-tree (*anacardiaceæ*); kid gloves, which are made of lamb, sheep, or rat skins; lunar caustic (nitrate of silver), so called because silver is the astrological symbol of the moon; meerschaum (foam of the sea), which is a compound of silica, magnesia, and water; pen, from the Latin *penna*, a wing, referring to the quill, becomes inappropriate when applied to a fabrication of steel or gold; Pompey's pillar was not erected by or in honor of Pompey; rice-paper, which is made not from rice, but from the pith of a Chinese plant of totally different character; salt, which is not chemically a salt; scuttle, applied to opening a hole in a ship, really means to close or bar; sealing-wax, which is not wax, but is composed of shellac, turpentine, and cinnabar; slave, which originated in a word (slavi) meaning illustrious, noble; tube rose, which is not a rose; turkeys, which did not originate in Turkey, but in North America; whalebone, which is not a bone.

MISPICK'EL, a mineral that occurs in trimetric crystals and which is composed of 33.54 per cent of iron, 33.42 per cent of arsenic, and 21.08 per cent of sulphur. Its color is silver-white, inclining to steel-gray; its hardness, 5.5 to 6; and its specific gravity, 6 to 6.4. Heated in a tube, it first yields a red or brown sublimate of sulphide of arsenic, then a black sublimate of metallic arsenic. Nitric acid decomposes it, with separation of sulphur and arsenious acid; nitro-muriatic acid, with separation of sulphur alone, which may be completely dissolved by prolonged digestion. It is found principally in crystalline rocks, especially associated with silver, tin, lead, and zinc ores; and is used chiefly in the manufacture of white arsenic.

MISPRIS'ION is, in English law, a clerical error made in drawing up a record of a court of law.

MISREPRESENTA'TION, in point of law, or, as it is most frequently termed, fraudulent misrepresentation, is that kind of lie for which courts of law will give redress. It consists in a willful falsehood as to some material thing connected or not with some contract; the object being that the party deceived should act upon it as true. The legal result is, that if the party so relying on its truth and acting on it suffer damage, he can sue the deceiver for such damage. It has sometimes been supposed that the deceit or misrepresentation must have reference to some contract, or arise out of some confidential relation between the parties, and that the party making it should have some private interest to serve; but this is mistake; and recent cases have established, that if a person willfully—i.e., either not knowing anything at all one way or the other about the matter, or knowing the real truth, misrepresent something with the intention that a stranger should act on such misrepresentation, and such stranger does so act on it, and suffer damage, then the right of action accrues to the deceived party. One remarkable exception to this doctrine, however, occurs in the case of the contract of marriage, where either party has in general no remedy whatever against the other for misrepresentations as to his or her property, connections, etc. It is not necessary that the misrepresentation should be made in writing, in order to give rise to the action, except in cases where the party gives representations as to the conduct, credit, ability, trade, or dealings of a third party, in order that such third party shall obtain credit, money, or goods thereby. The doctrine of misrepresentation has acquired great consequence of late, owing to the extension of the system of joint-stock companies, and the practice of the directors and officers publishing or being parties to fraudulent reports, accounts, and circulars as to the credit and stability of such undertakings. It is now settled, that not only every director, but every clerk in the service of the directors, who knowingly and willfully concurs and takes a part in publishing or circulating such false reports, whereby strangers are led to believe and act on them, and thereby suffer pecuniary loss, is liable to an action of damages at the suit of such strangers. It is also a general rule affecting contracts (other than marriage), that misrepresentation in some material point bearing on the contract, and likely to induce the party to enter into such contract, will render the contract void; but in order to make a trifling misrepresentation have the same effect, the party must warrant such representation to be true; in which case, whether trifling or not, or whether willful or not, a misrepresentation avoids the contract; and this is generally the case in contracts of life and fire insurance. Against such a practice lord St. Leonards lately remonstrated, as one involving great hardship to the class of insurers, who, after paying premiums for years, find at last their security gone. Another class of fraudulent misrepresentations, of great consequence, and now brought within the criminal law to a large extent, is that of counterfeiting trade-marks, as to which, see TRADE-MARKS.

MISSA DI VO'CE, a term used in the art of singing, meaning the gradual swelling and again diminishing of the sound of the voice on a note of long duration.

MISSAL, the volume containing the prayers used in the celebration of the mass. Anciently, considerable variety in minor details prevailed among the books in use in different countries, and even in different churches of the same country. With the view of restoring uniformity, the pope, in virtue of a decree of the council of Trent, in 1570, ordered that all churches which had not, for a clearly ascertained period of 200 years, enjoyed an uninterrupted use of a peculiar service-book of their own, should henceforth adopt the Roman missal. Of this exemption, several churches in Germany, France, and even in Italy, availed themselves; but in later times the great majority have conformed to the Roman use. The Roman missal has twice since that date been subjected to revision and correction—in 1604 by Clement VIII., and in 1634 by Urban VIII. The latter recension still continues in use. The missals of the oriental rites differ from that of the Roman church, each having for the most part its own proper form. See LITURGY.

MISSAL (*ante*), Lat. *missale plenarium* or *plenarium*, the book which contains the ritual for the celebration of the various masses of the Roman church, was called in the early western church *sacramentarium*, but at that time it contained only parts of what is now included in the missal. Those copies which contained the gospels, the sacramentary, prayers, prefaces, benedictions, the canon, lectionary, epistles and the antiphon were called *plenars;* but commonly these parts of the missal were in separate volumes. The entire missal was required when the priests began to say low masses. The earliest Gothic or Gallican missals of the 6th c. contained only the canon, prayers, and prefaces, which were recited by the bishop or priest; afterwards, those of small churches had the introit, gradual, alleluia, offertory, sanctus and communion. To meet a general desire for an emendation of the missal it was decided by the council of Trent, after a protracted discussion, to recommend to the pope the reform of the breviary, missal, and rituals. He consented, and the work was begun in Rome under Pius IV., and finished under Pius V. in 1570. The new missal consists of an introduction, three parts, and an appendix. The introduction gives the calendar and the general rubrics; the three parts give the formularies for the successive services of the year, those for the celebration of the mass on special feasts of saints, etc.; the appendix gives the annual mass, masses for the dead, some benedictions, and masses for certain prescribed feasts.—In the English church before the reformation the missals were very different, and even after the compilation of the Roman missal, the English were generally used; but at the end of the 16th c. the Jesuits forced the Roman missal upon the Roman Catholic churches of England. Before the invention of printing, the missals were elegantly written, ornamented with beautiful initials, and superbly bound. In the 13th c. large letters were used in writing the missals.

MISSAU'KEE, a co. in central Michigan, drained by Clam lake, Muskrat lake, and the headwaters of the Muskegon, Manistee, and Clam rivers; 576 sq.m.; pop. '80, 1553—994 of American birth. Its surface is considered fertile, is generally level, with a large proportion of timber land, and very thinly settled. Capital, Lake City.

MISSINNIP'PI RIVER. See CHURCHILL RIVER, *ante.*

MISSION, a term used by Roman Catholics and English and American ritualists in a sense similar to the word *revival.* Among Roman Catholics a mission consists of special religious services conducted generally by one who has no parish, and belongs to a monastic order. In this sense the word is modern. In the church of England and the Protestant Episcopal church in the United States the word denotes "a series of services in which prayer, praise, preaching, and personal exhortation are the main features, and is intended to call souls to repentance and faith, and deepen the spiritual life in the faithful." It is held in a parish or several parishes under the direction of the rector, or by some experienced priest whom he obtains to assist him. "Its themes are heaven, hell, the judgment, sin, the atonement for sin, God's justice and God's mercy." "The purpose is the proclamation of the old foundations of faith and repentance to souls steeped in worldliness and forgetful of their destiny, whether they be the souls of the baptized or the unbaptized." The usual time for the "mission" is Lent. In England it has been a custom for several years, and is approved by the bishops, who prescribe no rules for its observance, but leave it to the good judgment of the clergy. It is not yet favored by many in the Episcopal church in the United States. In these services the prayers are, or at least may be in part, extemporaneous; much preaching is allowed, and the preaching is earnest, personal, and practical; familiar hymns and tunes are used, and the singing is congregational. *The Church Journal and Gospel Messenger* favors the "mission."

MISSIONS, enterprises of the Christian church for the conversion of the nations to Christianity, by sending to them teachers called *missionaries.*

The first Christians displayed great zeal in preaching the gospel to the heathen; Christian teachers continued to go forth for this purpose into heathen countries until about the 9th c., and although other and less worthy means were too often employed, the labors of Palladius in Ireland, of Columba in Scotland, of Augustine in England, of Gallus and Emmeran in Alemannia, of Kilian in Bavaria, of Willibrod in Franconia, of Swidvirt in Friesland, of Siegfried in Sweden, of Boniface in Thuringia and Saxony, of

Adalbert in Prussia, of Cyril and Methodius amongst the Slavonians, and of many such early missionaries, were unquestionably very instrumental in the extension of Christianity in Europe. After the reformation, the Roman Catholic church, roused to activity by its losses and dangers, not only sent forth missionaries to confirm its adherents in Protestant countries, and to win back Protestants, but also sought to repair its losses by new acquisitions from the vast domain of heathenism. With this view, the *Congregatio de Propagandâ Fide* was constituted by Gregory XV. in 1622, and the *Collegium de Propagandâ Fide* (see PROPAGANDA) by Urban VIII. in 1627, and in a number of places institutions called *seminaries* were established for the training of missionaries. Jesuit missionaries earnestly prosecuted their work amongst the Indians of South America, from the middle of the 16th c. to the middle of the 18th, when they were expelled by the Portuguese and Spanish governments, because their political power had become too formidable. They are accused of administering baptism with too great readiness; but they were certainly successful in extending civilization amongst the Indians, particularly of Paraguay. Jesuit missions to India and Japan were founded by Francis Xavier (q.v.) in the middle of the 16th century. In Japan, the missionaries made great progress at first; and in 1582 they boasted of 150,000 converts, 200 churches, and 59 religious houses of their order in that empire; but ere the middle of the 16th c. the whole work had been overthrown, and every missionary expelled. In China similar rapid success was enjoyed, and was followed by a similar period of persecution, although the destruction effected was more partial than in Japan, and the church of Rome continued to subsist in China, its missionaries and members enduring great hardships, and many of them evincing their sincerity even by their death. There are not a few Roman Catholics in China at the present time. In Abyssinia, also, the Jesuits made great progress in the 17th c., and for a time attained great power in the country; but their interference in political matters led to their complete expulsion. In the 17th c. the Jesuits boasted of the vast success of their mission in Madura, a province of southern India; but it was found to be rather apparent than real, and to have been attained by a compromise of Christianity and the employment of unworthy means, so that, after long contests in the papal court, a decision was pronounced against the Jesuits, and their connection with Madura was dissolved in the middle of the 18th century.

For a long period after the reformation, the Protestant church seems to have been little sensible of the duty of laboring for the propagation of Christianity; nor was it until the present century that missionary zeal began to be largely developed. In the middle of the 17th c. (1647), indeed, an act of the English parliament established the *Society for Propagating the Gospel in Foreign Parts*, and at the close of the century (1698) the *Society for Promoting Christian Knowledge* was established. A few missionaries labored with zeal and success among the North American Indians, in which field the names of Eliot and Mayhew are particularly distinguished in the 17th c., and that of Brainerd in the 18th; but the commencement of more systematic and continuous missionary enterprise may be reckoned from the establishment of the first Protestant mission to India, which did not take place till the beginning of the 18th c., when Bartholomew Ziegenbalg and another were sent thither by Frederick IV. of Denmark, and settled in a small territory then belonging to Denmark on the coast of Coromandel. The mission in the s. of India soon received the support of the English *Society for Promoting Christian Knowledge*, and was maintained and extended chiefly by that society during the whole of the 18th century. Amongst the missionaries who labored in this field, the name of Swartz is particularly distinguished; and the success which attended his exertions, and the influence which he acquired in the country, were equally remarkable. He died in 1798. Since that time, the missionary work in the s. of India has been carried on with continued success, and by the missionaries of a number of societies. Greater progress has been made there than in any other part of India, nor, indeed, was the work commenced in any other part of India till almost a century later.—The Moravian church early entered upon missionary enterprise, and was the first Protestant church which did so in its united or corporate character; and very successful missions of the United Brethren were planted in the 18th c. at the cape of Good Hope, in the West Indies, and in Labrador. Greenland had previously been made the field of similar enterprise by missionaries from Norway. The mission to Greenland was founded by Hans Egede (q.v.) in 1721, and has been maintained to the present day. Its success has been such, that the greater portion of the Greenlanders have now been converted to Christianity, and much of the rudeness of their former manner of life has disappeared.—Towards the close of the 18th c., some of the great missionary societies still existing in England were formed—the *Baptist Missionary Society* in 1792, the *London Missionary Society* in 1795. About the same time the *British and Foreign Bible Society* and the *Religious Tract Society* were formed, which have co-operated with all the missionary societies as most important auxiliaries. The *Baptist Missionary Society*, immediately after its formation, sent missionaries to the n. of India. Dr. Carey was one of its first, and also one of its most eminent missionaries. India is now a field of labor for many missionary societies, not only of Britain, but also of America and of the continent of Europe

The *London Missionary Society* sent its first missionaries to the South Sea islands, and the mission was maintained for about 16 years, amidst many difficulties, without any apparent success; but its success was afterward great and rapid, first in Tahiti, and afterward in other islands, so that now many of the islands of the South Seas are entirely Christian. The London missionary society soon entered also upon other fields of labor, and now maintains missions to many parts of the world. It was at first composed of members of almost all Protestant denominations; but the formation of other societies, and the engagement of churches as such in missionary enterprise—as the Wesleyan Methodist church—have left this society now in a great measure to the English independents. One of the most important societies founded during the present century, the *Church Missionary Society*, formed by members of the Church of England, has sent forth missionaries to many fields. They have been particularly successful in New Zealand, the w. of Africa, and about Hudson's bay; and they recently entered Abyssinia. The various churches in Scotland also support vigorous mission agencies. The late Dr. Livingstone, of the London missionary society, explored vast regions in Central Africa. Fired by his example, the friends of missions in Scotland subscribed £12,000 to found *Livingstonia*, a memorial mission station on lake Nyassa, under the management of the Free Church foreign missions committee; and an expedition arrived there and established itself in 1876. Various other missionary societies, Catholic and Protestant, have selected stations in the region of the great lakes. The Wesleyan Methodists have missions in many parts of the world. They have been particularly successful in the Fiji islands, and in parts of the w. of Africa.—The *American Board of Commissioners for Foreign Missions* was formed in 1810, and was soon followed by other missionary societies in America, some of which rival those of Britain in magnitude and importance. One of the first enterprises of the American board was the mission to the Sandwich islands, founded in 1819, which has resulted in the general Christianization of these islands, and in their civilization to a degree which, considering the shortness of the time, may well be regarded with admiration. The *American Baptist Missionary Society* has occupied Burmah and the eastern peninsula as one of its principal spheres of labor, and there its missionaries have enjoyed remarkable success in the Christianization and civilization of the people called Karens. Protestant missionary societies have also been formed on the continent of Europe, of which the first was that of Basel, in 1816, and the next was that of Berlin, in 1823; and some of these have also maintained successful missions in heathen countries. The instances of most marked and extensive success of missions are those which have been already noticed, and that of Madagascar, where missionaries of the London missionary society enjoyed the protection and favor of king Radama I., and the church planted by them continued to exist, notwithstanding severe persecution, and the martyrdom of not a few of its members, during the next reign, and is a wonderfully flourishing church at the present day. In the s. of Africa, also, important results have been attained. Access has recently been obtained to China, and a number of Protestant churches and societies have entered energetically upon that field. Preparation had been previously made for this, by missionary labors amongst the Chinese in the eastern peninsula, and by the study of the language, the compilation of grammars and dictionaries, and the translation of the Bible into the Chinese language. Indeed, it must be reckoned as among the services rendered to mankind by Christian missionaries in modern times, that they have not only translated the Bible and other religious books into many languages, but have reduced many barbarous tongues to writing, and have prepared grammars and dictionaries, thereby contributing not a little, independently of their highest aim, to the promotion of knowledge, civilization, and the welfare of the human race.

The progress of Christian missions to Mohammedan countries has hitherto been very small, although numerous converts from Mohammedanism, as well as from heathenism, have been made in India. Of late, some have thought they observed a movement among the Mohammedans of India, apparently tending toward Christianity; but at the same time there has been a new awakening of Mohammedanism itself in the eastern peninsula and the islands of the Malayan archipelago. Missions to the Jews have for several years engaged not a little of the attention of some portions of the Christian church, particularly in England and Scotland. Missions have been planted in places where Jews are numerous, and already with considerable success.

MISSIONS, CHRISTIAN, FOREIGN (*ante*). The foundation of the work of missions is the command of Christ given to his disciples immediately before his ascension, "Go ye into all the world, and preach the gospel to every creature." Tracing the apostles and early Christians in their fulfillment of this command, we find at the close of the 1st c. many large churches in Asia Minor, Macedonia, Italy, Greece, and the islands of the Mediterranean, and in Northern Africa. In the beginning of the 2d c. the persecutor Pliny, in his official report to the emperor Trajan, says: "Many persons of every rank are accused [of Christianity]. Nor has the contagion of this superstition pervaded cities only, but the villages and open country." Justin Martyr, A.D. 106, says, "There is not a nation, Greek or barbarian, among whom prayers and thanksgivings are not offered to the Father and Creator in the name of the crucified Jesus." Tertullian, in his "Apology" about the middle of the 2d c. says, "Though of yesterday, we have filled every sphere of life—the exchange, the camp, the populace, the palace, the forum." Such an extension of Christianity in the face of stripes, imprisonment, and death, speaks strongly for the missionary zeal of those early times. During the 2d and 3d centuries we find that missionaries have been successful in Gaul, southern Germany, Arabia, and

Ethiopia. Early in the 4th c. Constantine, constrained by the prevalence of Christianity among all classes of his people, immediately subsequent to the terrible persecution by Diocletian, published, A.D. 312, his edict of toleration throughout the Roman empire. There is evidence that the Nestorians began in the 4th c. and for a thousand years carried on missions in central and eastern Asia. But no missions were more successful in these early times than those from Ireland to continental Europe in the 5th and 6th centuries. In the 5th c., the gospel was preached in Ireland by Patrick, who, born of Christian parents, and instructed in the gospel, having been twice taken captive by pirates, and carried to Ireland as a slave, felt impelled, after escaping the second time, to return to the land of his bondage, and make known there the gospel. He preached with such power that the island became nominally Christian before his death. Born in France, or in Scotland, he was ordained in France; he seems to have had no close attachment to the Roman church; and his successors long resisted the efforts of the pope to bring them under control. He established schools for educating the people in the gospel, and for training a native ministry and missionaries. At his death there were in Ireland many of these institutions, from which missionaries went forth in the 6th and 7th centuries to evangelize the barbarians of central Europe. Here also they established many schools, one of which was at Erfurt, where Luther studied centuries later. Columba went in the 6th c. from the institution of Bangor, Ireland (sometimes confounded with Bangor in Wales), with 12 associates, founded the celebrated school in Iona, which attained a high reputation for biblical studies, and from which missionaries went to the northern and southern Picts of Scotland, to the eastern coast of England, and to the European continent. Columbanus from the same institution took 12 young men, and carried the gospel to the Burgundians, Franks, Swiss, and Italians; also to the Bavarians and other Germanic nations. His pupil Gallus, also an Irishman, was the apostle of Switzerland. Neander says that when Columbanus entered Germany at the close of the 7th c. it was almost wholly heathen, but before 720 the gospel had been proclaimed by himself and his countrymen, and "all the German tribes were obedient to the faith as taught by the Irish missionaries." "Their teachings," as shown by Ebrard, "consisted in reading the Scriptures in the original text, translating them wherever they went, expounding them to the congregations, and recommending their diligent perusal. These were their only rule of faith." These missions and institutions were in the 8th c. absorbed by the Roman church, and in the 12th c. the Irish clergy were subjected to its sway. Iceland, Christianized in the 10th c., sent out missionaries in the exploring ships of the Norsemen, and is believed to have carried the first knowledge of Christ to the Greenlanders in the 12th century.

Returning to the Roman empire we find that the cessation of persecution, though most just and beneficent, opened the way for evils which hitherto had lacked opportunity of development. The state having become reconciled to the church, the church in turn became reconciled to the state, caught its spirit and imitated its modes. Christ had said to his disciples, "The princes of the Gentiles exercise authority, but it shall not be so among you." The church lost sight of this, and pastors, who had hitherto served the flock, and won honor by their service, began to change the crook into the rod. Not at once, or rapidly, but gradually the spirit of domination grew. Those who gained power sought to extend it by increasing the number of nominal converts, and proselytism rather than conversion became the passion of the time. Gregory the Great in 596 sent Augustine with 40 monks to effect the conversion of the Anglo-Saxons. The Irish missions from the school of Iona had already introduced the gospel along the eastern shores of England. Ethelbert, king of Kent, had married a Christian princess, and yielding to the eloquence of Augustine, or the persuasions of his wife, was baptized. Many of his subjects followed his example, 10,000 being received into the church on one occasion. Augustine was made archbishop, and claimed to govern the older Christian churches, as well as his own converts. Those churches indignantly objected, saying, "We are all prepared to hearken to the pope of Rome and to every pious Christian, so as to manifest to all perfect charity. What other duty we owe to him whom you call pope, we do not know." The influence of Augustine with the Saxon kings, however, gave him the advantage in the contest, and before the Norman invasion few ventured to dissent from the Roman forms of worship. In 718 Gregory II. sent Boniface to Germany, not so much to convert heathen as to bring over to the Roman see the churches which had received the gospel through missionaries from Ireland, Burgundy, and Byzantium. Thenceforward the secular arm was often used for the extension of the faith, and where power was lacking for coercion, resort was often had to other measures which were at utter variance with the spirit of Christianity.

Before the close of the 14th c. not only was nearly all of Europe nominally Christian, but Mongolia, Tartary, Persia, and China had been visited and greatly influenced by bishops and friars sent out from the Roman Catholic church. The discovery of America in 1492 and the doubling of the cape of Good Hope opened the way for missions in new fields. The Spanish and Portuguese prosecuted their voyages of discovery, of traffic, or of conquest, taking with them missionaries authorized to effect the conversion of the natives. Mexico, Central and South America, and parts of India were among the countries thus visited. The institution, in 1530, of the order of Jesuits, who pledged themselves to go wherever the pope might send them, gave a great impulse to missions among the heathen. In Brazil, Peru, and New Granada, Jesuits, Franciscans, Dominicans, and Augustinians vied with each other in civilizing the wild tribes. In Mexico and California, as well as in the Portuguese possessions in India, the Jesuits were equally diligent. The inquisition was resorted to not only to restore heretics but to enforce conversion. It has been common for the Roman Catholic church to shield itself from blame in this respect by saying that it gave over the incorrigible to the secular authorities for punishment; but it is well understood that the secular authorities were under the control and did the bidding of the church. It is believed that in these days the church of Christ is learning again the spirit of Christ, and that persecution, formerly not unknown in any sect of the church, will hereafter be left to heathen powers.

In 1608 the French established prosperous missions among the Indians of North America. In the 16th, 17th, and 18th centuries unsuccessful attempts were made to bring into the Roman Catholic church the Christian church of Abyssinia, which for more than 1000 years had maintained an independent existence. At last, in 1859, the king of Tigré in Abyssinia, with 50,000 of his subjects, united with the church of Rome. The Roman Catholics now have considerable missions in China, Anam, India, in Senegambia, Natal, and among the Gallas in Central Africa, in some of the islands in Polynesia, and among the Indians of North America.

In beginning an account of Protestant missions it is proper to allude to the sending of 14 pastors from Geneva by Calvin in 1555, at the request of Nicholas Durand, to join the colony of French Protestants whom he had persuaded to accompany him to Brazil. Durand joined the church of Rome, put to death three of the Genevan teachers, and drove others back to Europe, the Portuguese massacring the remaining colonists. In 1559 Gustavus Vasa of Sweden established a mission among his subjects in Lapland, which was maintained for some years. The Protestant settlers of New England had, according to their own account, for one of their aims in coming to this country, "above all, that of extending the Redeemer's kingdom in lands where Christ is not named." The charter granted to the Plymouth colony by the king recognizes this "worthy disposition" of the petitioners, and thanks God for the privilege of engaging in "so hopeful a work" as the "conversion of savages" to "civil society and the Christian religion." In 1621 elder Robert Cushman, writing to England, reports the Indians as favorably disposed to religion and humanity, and some of the natives giving evidence, living and dying, of conversion to God. The charter given by Charles I. in 1628 to the Massachusetts colony declares that "to win the natives of that country to the knowledge and obedience of the only true God and Savior of mankind and the Christian faith, in our royal intention and the adventurers' free profession, is the principal end of the plantation." The seal of the colony had as its device the figure of an Indian with a label in his mouth, on which was inscribed the Macedonian cry, "Come over and help us!" This object was kept in view, though the settlers were harassed by the hardships and struggles incident to their condition, and, as circumstances allowed, carried out in the lives of those first settlers, and it bore fruit in the Christian walk of converts. In 1643 Thomas Mayhew began labors among the Indians of Martha's Vineyard and Nantucket, and five generations of that family furnished pastors for the churches so gathered. In 1646 the legislature of Massachusetts passed an act for the propagation of the gospel among the Indians, and the same year the celebrated John Eliot began to labor among them. In 1649 the society for propagating the gospel in New England was formed in England, which aided in the support of Eliot, Mayhew, Bourn, and other missionaries among the Indians. A settlement of praying Indians was soon formed, and a church organized in Natick in 1661. Eliot traveled extensively among the Indians, and once preached the gospel to the famous king Philip of Pokanoket, who rejected it with disdain. He translated the Bible and other Christian books. His translation published in 1663 was the only Bible printed in America before the revolution. In 1675, through the labors of Eliot and others, 14 settlements of praying Indians had been formed, and 24 regular congregations, and there were as many Indian preachers. The converts adopted civilized and Christian modes of life, and became industrious and virtuous citizens. In 1733–45 Mr. Parks labored among the Indians of Rhode Island. They abandoned their dances and drunken revels, and crowded the places of worship. Sixty were received to the church. In 1734 Mr. J. Sargent, resigning the office of tutor in Yale college, labored with the Mohegans till his death in 1749. He found them "living viciously in miserable wigwams; he left them settled in a thriving town at Stockbridge with good houses." The great and good Jonathan Edwards labored 6 years among them. From 1734 to 1782 the Moravians labored with great patience and self-denial for the Indians in various parts of Pennsylvania, New York, and Connecticut. Of these missionaries count Zinzendorf, Christian Henry Rauch, and David Ziesberger are worthy of special notice. Many converts were made. From 1743–47 David Brainerd lived a martyr-life among them, teaching and converting many. The Rev. William Tennent, also John Brainerd, and a converted Indian, Samson Occum, and many others worked earnestly and successfully. The French and English war came, and the war of the revolution. The Christian Indians took no part in these, and were consequently suspected by each party of secretly sympathizing with their enemies. They suffered much from the belligerents, their settlements being broken up, their villages and farms destroyed. Reports of the work among the Indians excited great interest in England, and funds continued to be raised for its advancement. Dr. Luesden informed Cotton Mather that the example of New England awakened the Dutch to seek to convert the heathen in their East Indian possessions. Referring to it, bishop Burnet says: "The church of England, moved by the example of the dissenters, whose labors they admired, formed the society for promoting Christian knowledge." Some members of this society in 1701 formed the society for the propagation of the gospel in foreign parts, which was sanctioned by William III. It began mission work in India in 1727, and has had missions in Delhi, Poona, Ahmednuggur, Kolapore, the Nizam's dominions, Bangalore, Cuddalore, Tinnevelly, Arcot, Madras, Madura, and Calcutta. The mission of this society in Tinnevelly district has had great success in recent years, 23,654, from July, 1877, to the end of June, 1879, having asked Christian instruction. In 1879 this society had 569 ordained missionaries, 578 native catechists, 212,051 baptized persons, 41,418 communicants.

In 1705 Frederick IV., king of Denmark, sent Ziegenbalg and Plutschau to Tranquebar, on the Coromandel coast, to convert his heathen subjects. So averse were the natives to having foreigners acquire their written language that the king put their teacher in prison, and loaded him with chains. Ziegenbalg himself was imprisoned four months. Persevering amid great discouragements the converts at his death numbered 355. In 1711 the translation of the New Testament into Tamil was finished. Grundler, Schultze, and Dahl continued the work after Ziegenbalg's death; and the rajah of Tanjore, who had forbidden Ziegenbalg to enter his territory, was so won by their consistent lives that he threw open his kingdom to the gospel. The work was, however, retarded by the wars of the English and French between themselves and with the native princes; and the immoralities of European residents and travelers prejudiced both Hindus and Mohammedans against Christianity. In 1728 Schultze removed to Madras and formed the Vepery mission. In 1750 Christian Frederick Schwartz arrived in India. He labored 48 years at Tranquebar, Trichonopoly, Tanjore, and in Ceylon. During 10 years in Trichonopoly he baptized 1238. The simplicity and earnestness of his life won the confidence and respect of heathen and Mohammedan princes. The English government sent him to negotiate a treaty with the haughty and powerful Hyder Ali. Hyder had said: "Let them send me the Christian; he will not deceive me." When near death the rajah of Tanjore committed to his guardianship his adopted son and heir, Serfogee. Serfogee, when king, erected a monumental slab to the memory of Schwartz in the church where he had been wont to preach, in which groups of children and native men, and Serfogee himself, are represented as mourning his death, while he is depicted as looking at the cross.

In 1708 a Danish mission was sent to Greenland. In 1709 the Society for promoting Christian knowledge was formed in Scotland, and by it David Brainerd was sustained among the Indians. Through the influence of Hans Egede, Frederick IV., of Denmark, established a seminary at Copenhagen to train missionaries for Greenland. It was here that count Zinzendorf was first impressed with the duty of spreading the gospel, and when he returned to Hernhutt the Moravians seemed at once inspired with a wonderful zeal in the cause of missions. They looked upon it as the great business of the church, and claimed that every member should contribute to its support. One in 50 of the entire membership devoted themselves to labor in the foreign field. From 1732 to 1853 they had stations in the West Indies, Greenland, among North American Indians, and in Labrador, South America, Australia, and Thibet; and the whole number of missionaries engaged during those years was 2,300, exclusive of native assistants. In 1879 they reported 99 stations, 324 missionaries, 1485 native helpers, 24,439 communicants, 18,856 baptized adults, and an income of $91,715.

In 1789 William Carey, a Baptist minister, endeavored to reawaken in England an interest in the subject of missions to the heathen, but it was not till 1792 that a society was formed, which sent Carey and Thomas to Calcutta. The East India company forbidding their going in the company's ship, they left it and went in a Danish vessel. Obliged for a time to support themselves by superintending an indigo factory, they preached and taught among the native employes and in the neighboring villages. Marshman and Ward also were sent, but, owing to the hostility of the company, were obliged to proceed to the Danish settlement at Serampore, where the Danish governor, who had previously enjoyed the ministry of Schwartz at Tranquebar, gave them and Carey also his protection. In 1816, 700 natives had been baptized, and 10,000 children had received Christian instruction. The same society in 1797 established a mission in Dingapore, another in 1804 in the Jessore district; also in Chittagong, in Dacca, in Barisal (where in 1873 there were 4,600 converts and 40 native teachers and preachers), in Agra, Allahabad, Benares, and Delhi. In the mutiny of 1857 two missionaries and their families at Delhi were massacred, but after the siege the mission was renewed, and made great progress. The society sent missionaries to the West Indies and Africa. The missions in Jamaica have become self-supporting since 1842. It has missions also in Norway, Italy, and China, and reported, in 1878, 86 European missionaries, 40 native missionaries, 205 evangelists, 112 stations, 29,496 church members, 348 teachers, 15,079 scholars, and an income of $250,844. The *General Baptists* formed a distinct society, sent a mission to Orissa, India, in 1822; and in 1878 had 7 stations and 5 branch stations, 14 European agents, 15 native preachers, 884 members, and an income of $42,000. They have now begun a mission in Rome.

The London missionary society was formed in 1795. Their mission in the Society islands, established 1797, was without apparent success until, in 1816, king Pomare II. embraced Christianity. In 25 years the islanders had relinquished idolatry and cannibalism, had learned to read, had made great improvement in social habits, and many of them lived the Christian life. French Catholic priests reached the islands, but were not allowed to remain. The islands were soon after this seized by the French government in the interest of the Roman Catholic missionaries. In 1807 this society sent Dr. Morrison, the first Protestant missionary, to China, who translated the New Testament and, with the aid of Dr. Milne, the Old Testament into Chinese. It established missions also in the Indian archipelago, in Mauritius, in Southern Africa, where Moffat for 52 years with great success taught Christianity and civilization, beginning in the kraal of Africaner and extending his labors to several native tribes, and where Livingstone began his unprecedented career as a missionary and explorer. Their missionaries sent in 1820 to Madagascar were the instruments of introducing Christianity there. They were expelled for a time, but the "praying ones," as the converts were called, continued to increase during their absence, notwithstanding a terrific persecution in which the queen is said to have slaughtered as many as 2,000 of her best subjects in a single year on account of their adhesion to Christ. After her death the missionaries were invited to return, and religious liberty was enjoyed. Half a million of people have renounced idolatry, and 60,000 have confessed Christ. In 1880 this great society had 136 ordained European missionaries, 371 ordained native ministers, 4,529 native preachers, 89,487 communicants, 389,898 native adherents, 75,914 pupils. Its missions are in China, India, Madagascar, Africa, West Indies, and Polynesia.

The Church missionary society was formed in 1799. Finding none in England to engage in the work, they for a time employed Germans. William Wilberforce was one of its warm supporters, and its first mission was naturally to the west coast of Africa. It had to struggle against the intrigues of the slave-traders and a most unpropitious climate, but after the transfer of the colony to the government of England the Sierra Leone mission became stable and successful. Their mission in the Tinnevelly district has received great accessions within two or three years, 11,000 heathen having sought instruction preparatory to baptism in 1878. The society had in 1878, 181 stations, 203 European ordained missionaries, 11 East Indian, 170 native do., 2,183 native male assistants, 497 female assistants, 27,080 communicants, 123,724 Christians baptized, 1499 schools, 57,145 scholars. It has a missionary institutution at Islington.

The Wesleyan Methodists engaged in mission work as early as 1786, when Dr. Thomas Coke went to the West Indies. In the conduct of missions there and in America he crossed the Atlantic 18 times. He died in 1813, on his way to the East Indies for the purpose of establishing a mission. His five companions of the voyage began a mission in Ceylon, which afterwards extended its labors to the continent. There was no regularly organized Wesleyan misssionary society until 1817. It has since carried on missions in Spain, Portugal, Africa, India, China, Australia, in the Fiji islands, where "cannibalism, war, and murder ceased wherever they penetrated," and in the Friendly islands, where the once hostile tribes are united under the native convert king George, who is Christian preacher as well as king, and among the negroes of the West Indies, where they have been very successful. This society has 429 stations, 457 missionaries and assistant missionaries, 9,882 catechists, local preachers, and teachers, 83,770 full church-members, 92,924 scholars.

The church of Scotland formed a missionary society in 1824, and began its work in 1829 by sending Dr. Duff to Calcutta, who with his schools made a powerful impression on the native young men of that city. At the disruption of the Scotch church its missionaries joined the Free church. The State church of Scotland has missions at Calcutta, Madras, Sealcote, Darjeeling, and Bombay, with an income of $51,000. The Free church of Scotland has missions in India, South Africa, Australia, and Syria, and among the Jews at different points, their school in Constantinople having 200 pupils. It has 45 Europeans and 196 natives employed in mission work, 2,163 communicants, 11,086 pupils, and an income of nearly $100,000. The United Presbyterians of Scotland have 48 missionaries and 8 medical missionaries in the West Indies, Spain, Old Calabar, South Africa, India, and China; 6,927 communicants, and an income of $190,000. The Presbyterian church of Ireland had in India and China in 1879, 8 missionaries, 11 native evangelists, 236 communicants, 1082 baptized natives, and an income of $73,755. Many other societies in Great Britain, local or limited in sphere, do very useful work.

The missionary interest in the United States during the 17th and 18th centuries had been expended in efforts to Christianize the Indians, and evangelize its own wide newly-settled regions. In looking for the origin of the foreign missionary work in America we find three young men in Williams college withdrawing one summer afternoon in 1807 to a retired field, telling each other their impressions concerning the condition of the pagan nations, and kneeling there to implore divine direction as to their duty. They converse privately with ministers on the subject, sometimes venturing to allude to it in a prayer-meeting. In 1810 they with others unite in an appeal to their "revered fathers" of the general association (Congregational) at Bradford, Mass., who, recognizing their impressions as a "divine intimation of something great and good in relation to the propagation of the gospel," proceeded to constitute the American board of commissioners for foreign missions. Its first missionaries to foreign lands were Newell, Judson, Hall, Nott, and Rice; all of whom were, on their arrival at Calcutta, ordered by the East India company to return in the vessels which brought them. Judson and Rice having on shipboard changed their views in regard to baptism, united with the Baptists and left the American board. Hall and Nott went to Bombay, and were ordered to return, but after much discussion and negotiation with the East India company and the home government were allowed to remain. Thereafter India was open to American missionaries. Newell on being sent from Calcutta went with his wife to the Isle of France, where she died. He went ultimately to Bombay. In the East Indian field the American board has since conducted with success missions in Ceylon, Ahmednuggur, Madras, and Madura. In 1817 the Rev. Cyrus Kingsbury commenced labor among the Cherokees. The work was extended to the Choctaws, Chickasaws, Creeks, Seminoles, Dakotas, Sioux, Ojibwas, Ottowas, Iroquois, Cayugas, Walla-Wallas, and Nez Perces. Between 1817 and 1860 the American board expended among the Indians $1,100,000, and the laborers employed were more than 500. Other societies have done much. The work has been greatly thwarted by successive removals of the tribes, the sale among them by government agents of intoxicating liquor, and prejudice awakened by the fraudulent dealings of white men. Yet some of these tribes are recognized as civilized communities, and compare favorably with the white people about them. Ten thousand of the Indians are members of Christian churches, and 75,000, including women and children, conform to the customs of civilized life. In some instances, while Christians were turning their thoughts towards foreign lands, events in those lands were preparing the people for the coming of missionaries. Vancouver in his four visits to the Sandwich islands had given the people some thoughts on the folly of idolatry, and had told them that missionaries would some time come to teach them, to whom they must listen. Kamehameha I. was so far influenced that in his last sickness he forbade the customary offering of human sacrifices. Reports reached the people of the cessation of idolatry in the Society islands and of the great improvement in the condition of those islanders. Five Sandwich Islands youths who had gone with American shipmasters to America were receiving a Christian education, and one of them had written to his father describing the advantages of the Christian religion. The people also had become restive under the restrictions of the *taboo* system, and had noticed that foreigners incurred no risk by their non-observance. The mother of the new king Liholiho first broke taboo, and many of the chiefs, and at length the king, did so also, and afterwards destroyed the idols. It was the presence of the Sandwich Islands youths in America that induced the American board to send a mission to those islands; and in 1820, when the people were breaking taboo and burning idols, the missionaries, wholly uninformed of these events, were on their way from Boston. They found a nation open to instruction. The details of the work among them are of remarkable interest, and those islands are now, in the usual sense of that term, a Christian people. There are now 12,360 members in 57 churches, most of them having native pastors.—In 1820 the American board began mission work in Turkey, sending Parsons and Fisk to Smyrna. In 1831 Goodell, having carried an Armeno-Turkish translation through the press at Malta, reached Constantinople. A succession of able laborers, male and female, have continued the work to the present time through numerous cities and villages of both European and Asiatic Turkey. In 1827 the Maronite patriarch, in his decree of excommunication against the missionaries, by which the people were forbidden to deal with them in any way, stated that "they are unwearied in their efforts;" that "they go about, manifesting a zeal in compassionating their neighbors;" that "they have opened schools and supplied instructors, all at their own expense;" that "in their outward works they appear as men of piety;" and that "the evil grows day by day." This truly, though inadequately, describes the work and the workmen for 60 years past; and though there has been much persecution, the results are equal to the work. Christopher R. Robert, a merchant of New York, erected a college in Constantinople and left property to sustain it. It has 250 students, of 13 nationalities. The native converts of Aintab have contributed largely towards founding a college which is in operation in that city. There are four theological seminaries in Marsovan, Kharput, Marash, and Mardin. Though the work has been directed chiefly towards the regeneration of various lapsed Christian sects, yet there is abundant evidence that indirectly thousands of Mohammedans have been convinced that there is a Christianity, which makes man kind and true, though it would be death to them to adhere publicly to it. They listen often to Christian preaching, their children attend the schools, and individually they sometimes show great enlightenment; but very few Mohammedans have dared to take a stand on the side of Christ. It is the view of the missionaries to "increase knowledge and conscience, to inculcate saving truth, to promote piety, and to leave forms and ceremonies, however vain and hurtful, to be disposed of by the people themselves when they should become Christians at heart." The trials and exposures undergone in caring for the sick and wounded during the recent Russo-Turkish war, and in distributing to the hungry in the famine, made a deep impression on the people. Throughout the Turkish empire, "despite oppression, misrule, and anarchy," says the last annual report of the American board, "the leaven of the gospel is doing its work." Of the agencies involved we may note the existence of 93 churches, with 6,500 members; nearly 500 pastors, preachers, and teachers; 30 colleges, seminaries, and high schools, attended by 1500 youth of both sexes in nearly equal numbers; 800 common schools, with over 9,000 pupils; and an educational and religious literature amounting in the past year to 13,000,000 pages.—In 1830 the rev. Jonas King entered the service of the American board as its missionary in Greece. He was already on the ground, having been sent by the ladies' Greek committee of New York with relief for the suffering in the struggle for independence. Dr. King preached the gospel in the parlor, in the street, in the school-room. He endeavored, through the teachings of the ancient Christian fathers, whom they revered, to lead the Greeks back to the simple truth of the gospel. He greatly improved the condition of the schools, translating school-books and providing slates and other aids, of which they had been destitute. His work was appreciated by parents and children, and in most cases by the government, but he was repeatedly brought to trial by the ecclesiastics, and often was in peril of his life. He, however, gained religious toleration for Greece. He was joined by the rev. Elias Riggs in 1833.—In Nov., 1835, rev. Justin Perkins and Dr. Grant, with their wives, reached Oroomiah for the purpose of laboring among the Nestorians of Persia. They were well received, bishops, priests, and deacons attending their schools, and inviting the missionaries to preach in their churches. Dr. Grant acquired great fame by his surgical skill, especially by successful operation for cataract, and gained access to wild mountain regions among Koords, where Christian travelers probably never had gone before. There are now 1152 members in the reformed Nestorian church, 18 ordained native pastors, 45 preachers, and 90 teachers and other helpers.—The mission to West Africa was commenced in 1834, the rev. J. L. Wilson and wife, with a colored woman, arriving at cape Palmas in that year, and from the first was undisturbed and effective. That to the Zulus in South Africa was begun in 1836. It met with many interruptions from sickness, death, and war. Its 15 native churches have had much to contend with, and some relapses into old customs are reported. Yet a good degree of desire is shown to make the gospel known to their heathen neighbors.—In Feb., 1830, the rev. Elijah C. Bridgeman, missionary of the American board, reached Macao, to establish a mission in China, and in 1834 was joined by Dr. Peter Parker. In 1835 Dr. Parker established an eye infirmary, which was supported wholly by foreign residents. With the exception of a few pupils under Dr. Bridgeman's instruction, it afforded for a time, through conversation and books, the only opportunity of making known religious truth. He had soon three Chinese students in medicine and surgery under instruction, and a hospital under his care sufficient for 150 patients. In four years he had treated 6,450 cases. This institution was favorably viewed by the government and gratefully appreciated by the people. Through it much Christian truth was dispensed. The treaty of China with the United States in 1861, known as the Tientsin treaty, stipulated "that the principles of the Christian religion are recognized as teaching men to do good, to do to others as they would have others do to them; any person, either citizen of the United States or Chinese convert, who, according to these tenets, peaceably teaches and practices the principles of Christianity, shall in no case be interfered with or molested." Thenceforth mission work was much extended in China. The American board has two great mission centers in China, the Foochow mission and the North China mission. It has 17 missionaries, 8 medical missionaries, 28 female assistants, and 25 churches. Of the missionaries of different names who traveled through the famine-stricken district in n.e. China bearing food to the hungry, five fell victims to their over-exertions. This self-sacrifice revealed the Christians, whom the Chinese had been taught from childhood to despise, in favorable contrast with their own mandarins. In one such district the people were led by this means to consecrate their temple to the Christians' God, and, after destroying the idols, to present to the missionaries a deed transferring the temple legally and perpetually as a place of Christian worship.

The China Inland mission. Mr. J. Hudson Taylor having been for several years in China, returned to England impressed with the immensity of the Chinese population, their deep spiritual needs, and the utter insufficiency of existing agencies for their evangelization. He sought without interfering with other enterprises to devise some way by which more could be accomplished. The Chinese inland mission was inaugurated by the sending of Mr. James Meadows from England to China in 1862. The principle adopted was that the missionary should go out without guaranteed support, trusting in God for what he might send. Mr. Meadows was followed by several others, and in May, 1866, by Mr. Taylor himself, taking his wife and four children, and accompanied by a party of thirteen new missionaries, "means having come unsolicited sufficient to meet the heavy expenses involved." They reached Chin-Kiang, a free port on the Yangtse-Kiang, in May, 1868, but were driven away by a mob, and their defeat became the "laugh of tea-house and restaurant." They removed to Yang Chau, a city of 300,000 people, reaching there June 1, and after a few weeks the whole party were near being burned alive in their own hired house by an infuriated mob, instigated by the literary class. Yet they were wonderfully preserved, notwithstanding the authorities of the town failed to succor them, and a few months later were in quiet possession of their premises in Yang Chau, "mobs and mandarins having found that they were ruled by principles more potent than the fear of mobs." These missionaries, accompanied by native helpers, and preaching and distributing Scriptures and tracts, have traversed 30,000 miles through new provinces. They number now 600 church members, occupying 60 stations, and have about 90 native laborers engaged as colporteurs, evangelists, pastors, and Bible-readers. For the past 14 years the work was performed by unsalaried officers, but as correspondence became heavy, in 1875 one salaried assistant secretary was employed, and in 1876 another. In July, 1837, Mr. King, of the house of Oliphant & Co., American merchants in Canton, accompanied by his wife and by Dr. Parker and Mr. Williams of the American mission, and taking with him 7 ship-wrecked Japanese sailors, whom he wished to restore to their country, sailed for Yeddo. Approaching the town they were fired upon by the Japanese and obliged to retreat. The same reception met them at another port, and they relinquished for that time the attempt to open intercourse with Japan. The commercial treaties of 1854 and 1858 between Japan and England and America having prepared the way, and other societies of America, England, and Scotland having already entered some parts of Japan, the American board sent missionaries in 1869 to that field, and has now in and around Osaka, Kioto, Kobe, and Okoyama, "4 principal and 14 out-stations, 16 churches, 12 of them self-supporting, with 500 communicants. Twelve missionaries, 3 physicians, 30 female missionaries, 8 native pastors, 18 evangelists, 14 teachers, and 7 Bible-women are at work." A native missionary society is formed, and is very useful, and the native Bible-women do much good among the native women. The American board in 1880 had 17 missions, 75 stations, 642 out-stations, 156 American ordained missionaries, 6 physicians unordained, 254 American assistants, male and female, 138 native pastors, 327 native preachers and catechists, 720 school teachers, 232 native helpers, 273 churches, 16,992 church members, 1185 pupils in training and theological schools, 1356 girls in boarding schools, 1096 other adults under instruction, 27,056 pupils in common schools. The whole number of pupils is 30,693. The board has 66 seminaries and colleges.

In 1858 the Reformed church, which till that time had co-operated with the American board, organized for itself the board of foreign missions of the Reformed church in America. It has very successful missions in China, India, and Japan; and in 1880 had 14 stations, 101 out-stations, 16 ordained American missionaries, 21 assistant American missionaries; 49 native ministers and catechists, 1719 pupils in day schools, 12 theological students, 2,341 communicants.

The American Baptist missionary union was formed in 1814, and at once assumed the support of Dr. Judson, who had been laboring in Rangoon, Burmah, since July, 1813. The early work in Burmah was greatly hindered by war, and the missionaries were inhumanly treated; but Dr. Judson was spared to do a great work among the Burmese and Karens, and Mr. and Mrs. Wade and many other earnest laborers have continued the mission with great success. The mission to the Telugus, begun in 1836, for many years alternated between success and failure, and again and again its relinquishment was proposed. In 1867 a remarkable work of prosperity commenced. The first church of Christ was organized by rev. Mr. Clough with 8 members, and in 8 years the number increased to 3,300. In 1876 came famine and afterward cholera, and again famine, terrible, widespread, and long continued. The missionaries were made almoners of the government, and thus gained access to many hundreds of persons, to whom they spoke of Christ. In 1878, within a few months, 9,147 were baptized.—The mission to Siam was begun in Bangkok in 1833. In 1877 there were 6 churches, 418 members (mostly Chinese), 7 chapels, 2 ordained and 6 unordained native preachers. The Siamese government has not only proclaimed toleration, but decreed that no master or relative shall compel any Christian to do acts contrary to his religion, as worshiping spirits, feasting spirits, laboring on Sundays, only excepting the case of war and public business of importance. The Baptist union has missions in Greece, Africa, Arracan, Assam, China, and Japan, besides some countries of Europe. It had in 1880 30 stations, 162 American missionaries, 616 native preachers, 475 churches, 40,087 church members. Income, $314,860.

The Methodist Episcopal missionary society was formed in 1819. It has successful missions in India, China, Japan, Africa, Bulgaria, Mexico, South America, and some countries of Europe. It had in 1880 97 American ordained missionaries, 63 female American missionaries, 138 native ordained preachers, 185 native unordained preachers, 197 local preachers, 390 teachers, 10,282 day scholars, 26,702 church members.

The Protestant Episcopal missionary society was organized in 1820. For some reason no mission was established till 1830, when the revs. J. J. Robertson and J. W. Hill, and Mr. Bingham, a printer, were sent to Greece. It has now missions in Greece, Western Africa, China, Japan, Hayti, and Mexico. In 1880 it had 141 stations, 5 American and 2 native bishops, 43 American and native priests and deacons, 4 physicians, 24 foreign lay workers, 164 native helpers, 2,500 pupils in boarding and day schools, 4,549 communicants.

The Presbyterians had since 1741 done missionary work, mostly among the Indians, under different organizations, which in 1831 were merged in the board of foreign missions of the Presbyterian church. Its first mission was to Liberia, where unusual obstacles presented themselves in climate and the character of the people. It is still continued; also the missions at Gaboon and Corisco. In 1833 the rev. Messrs. Reid and Lowrie were sent to Lodiana, in the far interior of India. Sickness and death weakened the mission, but it was reinforced, and useful native laborers have been raised up. That mission has now 10 stations. Their mission to Furruckabad, where Freeman and

Campbell, with their wives, were murdered in the Sepoy rebellion, was commenced in 1838, and has 7 stations. The Kolapore mission, which was begun as independent by the rev. R. G. Wilder, and has passed into their hands, has 3 stations. The converts—Mohammedans, Sikhs, and Hindus—have in some instances suffered great privations and persecutions. On occasion of the reuniting of the Old School and New School general assemblies, the Presbyterian board received an accession to its membership of the New School members of the American board (thus left entirely to the Congregational churches), and at the same time, in amicable transfers, the missions of that board in Syria, Persia, West Africa, and among the Seneca Indians of New York. Those missions have since been reinforced by the Presbyterian board. It has missions also in Siam, China, Japan, Brazil, Chili, the United States of Colombia, among the Indian tribes, and the Chinese of this country. In 1880 it had: ordained American missionaries, 125; ordained native missionaries, 83; licensed native missionaries, 147; American lay missionaries, male and female, 280; native lay missionaries, 516; communicants, 12,607; pupils in boarding and day schools, 17,791.

The Evangelical Lutherans began foreign missions in 1841. They have missions in India and Africa, with 5 ordained European missionaries, 2 ordained native missionaries, 42 native assistants, 250 communicants, 5,092 baptized converts, and 950 scholars. The Seventh-day Baptists began in 1842, and have small missions in West Africa and China. The Baptist church, South, began mission work in 1845, and has missions among the American Indians, and in Italy, Africa, and China. The United Presbyterian church, from its organization in America in 1858, has had missions in Syria, Egypt, India, and China. It had in 1880 23 stations, 18 foreign ordained missionaries, 8 native ministers, 12 teachers, 21 churches, 1218 communicants, 8,702 scholars. The Presbyterian church, South, was organized separately in 1861, during the rebellion; and in 1880 had 17 missionaries, 50 native laborers, 1400 communicants, 495 pupils, and an income of $48,485.

At the period when the subject of slavery was kindling intense feeling and heated discussion throughout the United States, some of the missionary societies sought to avoid being involved in those controversies as foreign to their objects, while some friends of the cause thought it impossible to maintain neutral ground. This led to separate organization.—The Free Baptist missionary society was formed in 1843, sending a mission to Hayti; and the American missionary association in 1845. The Union missionary, the committee for the West India mission, and the Western Evangelical missionary association, joined the American missionary association, taking with them their missions in West Africa, in the West Indies, and among the North American Indians. This society, now mainly in the hands of the Congregational churches, has operated in Siam, the Hawaiian islands, and also among the Chinese of California. The work in the Mendi mission and among the Chinese has been very successful. Since the slaves were emancipated, it has been chiefly occupied with a great work among the freedmen of the former slave and border states. It had in 1880 93 missionaries, 213 teachers, 76 churches, 5,084 church members, 71 schools, 10,020 pupils.

The American and foreign Christian union resulted from the union in 1849 of the Foreign Evangelical, American Protestant, and Philo-Italian societies. It has labored in Italy, Belgium, Sweden, Canada, Hayti, South America, and Mexico, and five years after its organization numbered 140 missionaries, half of whom were ordained. Denominational societies having become interested in the work, the union has transferred much of its work to them, and turned its attention more to our own country. It is still aiding the work of foreign evangelization, especially in France and Spain. In 1815 a seminary for the training of missionaries was founded at Basel, and in 1821 the evangelical missionary society was formed there, which employs in Africa, India, and China 98 European missionaries, 59 female missionaries, and 210 native laborers, and has 3,718 communicants. France, since 1822, has had a missionary society, with a mission among the Basutos of s. Africa, which has occupied 17 stations, has 69 native helpers, and 2,000 communicants.—In 1824 the Berlin missionary society was formed, and has a mission in southern Africa with 31 stations and 45 laborers.—The Rhenish missionary society, founded in 1828, has 16 stations in s. Africa, with 11,300 converts; also among the Battas in Sumatra, 11 stations, with 3,500 converts.—In 1836 the evangelical Lutheran missionary association of Leipsic was founded, and has in India 17 European missionaries, 16 stations.—In 1854 the Hermansberg society was organized, which has sent out entire colonies of missionaries.—There is also Gossner's mission union, founded in 1836 by Papa Gossner, as he was called, at 70 years of age, largely with his own resources. Its most interesting station is in and near Chota Nagpore, among the Kohls. The first convert was baptized in 1850, and in 1857 there were 800 converts. In the Sepoy rebellion they were hunted from their homes, their chapels were unroofed, and a price set on their heads. Those who survived gradually found their way back, rebuilt their huts and chapels, and in 1863 numbered 3,400. In 1871 there were 20,720 native Christians, 105 native preachers, and 1297 scholars.—The Friends' missionary society began their work by sending Rachel Metcalfe to India in 1866. This mission has been reinforced, and has now 11 members and 4 native teachers and catechists. In 1867, in response to an appeal from Mr. Ellis of the London missionary society, they sent Mr. Sewell to Madagascar, where they had assigned to them one of the 9 churches of the metropolis, with the work in a district 70 m. long, 35 m. wide. They have now 108 congregations, 3,250 members, 85 schools, and 2,860 pupils. When Mr. Sewell went there the majority in the district still trusted in their idols, but in two years had destroyed them all. In Syria also they are doing good work. These missions, though ascribed to English Friends, are largely aided in men and means from America. The American Friends have a mission in Mexico.

The first woman's missionary society in America, of which we find record, is the Boston female society for missionary purposes, organized Oct. 9, 1800, which was a union of Congregationalists and Baptists. After this they became common in many parts of the country. All of these societies simply *earned, collected,* and *transmitted* money for the use of the general societies. As in the progress of missions it became evident that the hostility of heathen women was a great obstacle to success, and as in many heathen countries, especially in India, they were unreached by the usual missionary agencies, it was felt that more direct efforts than had yet been made for their conversion, were necessary. Missionary women returning told to Christian women the dark and hopeless story of their sisters in India, and they longed to do more for them than had been done. It came to be believed by some that if women had the selection of their own agents, and the management of their own funds; if they originated their own methods, and arranged their own work, more would be accomplished than by the old methods. They at first desired to avail themselves of the acquired wisdom and experience of the older societies by some kind of co-operation, but their plans did not at that time meet with favor from existing boards. They therefore organized independently the woman's union missionary society. It was incorporated in New York in 1861. From the first it has been undenominational. Its higher officers have thus far performed their duties without remuneration. The number of missionaries employed since the formation of the society is 93; the number now in the field, 41; the present number of schools is 38; zenanas taught, 426; pupils in 1880 were 2,020. The largest annual collection was $54,207. Total receipts to May, 1879, $560,712. It has auxiliaries in 22 states. Various denominational woman's boards have since been formed, as the woman's board of missions, Congregational, in 1868; ladies' board of missions, Presbyterian, 1868; woman's board of missions of the interior, Congregational, 1868; woman's foreign missionary society, Presbyterian, 1870; woman's foreign missionary society of the Methodist Episcopal church, 1869; woman's Presbyterian board of missions of the northwest, 1870; Baptist ladies' missionary society, 1871; and many others. The total receipts of all such societies, as reported from the formation to 1880, reached about $3,000,000. It is impossible in the nature of the case to furnish statistics of results of this work. There is evidence, however, that it is useful and successful beyond anticipation, and that through it many women in India are receiving that enlightenment and blessing which ever follow the knowledge of the Lord Jesus Christ.

There are computed to be now 500,000 converts from heathenism in the world. The Protestant missionary societies of the world number 52. The missionaries in various fields supported by American Christians number 574. With very little exception, all the Protestant societies have carefully avoided interfering with each other's work, or entering each other's fields, and in many instances where their fields were adjacent there has been a delightful spirit of concord and mutual helpfulness.

Some striking facts connected with the progress of the gospel in the world may be mentioned here. A Christian lady of Calcutta, the wife of an English officer, had long desired to benefit the native women It happened one day that a native of rank, a former pupil, visiting at the house, saw and greatly admired a pair of beautifully embroidered slippers which the lady had completed for her husband. The lady offered to teach his wife to do such work if she might go to her. She allowed him to take home the slipper and consult the mother-in-law. Permission was granted her to go and teach the wife not only to sew, but to read, and ultimately to read the Bible. This is the door through which has been introduced the whole system of zenana meetings in India. The missionary ladies heretofore excluded are now admitted to the private apartments of thousands of the women, and their instructions are bearing cheering fruit in many hearts. Before the first Protestant missionary went to China in 1807 it was thought impossible for a foreigner thoroughly to acquire the Chinese language. Nevertheless, not only has the Bible been translated into three Chinese dialects, but a variety of useful books, as dictionaries, geographies, books on medicine, jurisprudence, etc., have been so translated as to be acceptable to intelligent Chinese, and some have been reprinted by them. At Shanghai alone the mission press issues 18,000,000 pages annually. The interior of Africa had for hundreds of years foiled the attempts of the very martyrs of science to penetrate it. Livingstone, fired with desire to open Africa to the gospel, and if possible to stop the fountains of the slave-trade, unlocked the regions so long closed. The results of his daring might have been partially or wholly lost had not Stanley followed him and brought report of a native king willing to listen to the gospel. Now all Christendom is combining for the conversion of the central portions of the dark continent, and at least five societies have sent missionaries to different posts in that region. The formation of a society of intelligent Hindus, the Brahmo Somaj, who reject idolatry and assemble for the worship of a supreme being, indicates the working of the leaven of Christian truth. Its present leader, Kesub Chunder Sen, says of India, "Native society is being roused, enlightened, reformed under the influence of Christianity." Sir Bartle Frere, who spent 30 years in India, said, "The teaching of Christianity among 160,000,000 of Hindus and Mohammedans is effecting extraordinary changes in India. The experience of a few more years will demonstrate the fact that the missionary enterprise is incomparably the most effective machinery that has ever been brought to operate upon the social, the civil, and the commercial interests of mankind." The last 10 years have witnessed a greatly increased success in missionary work. Missions have often been declared a hopeless toil; but if the recent rate of advance be maintained, the time will be not so remote as one might think who gave the subject only hasty thought, when the last heathen nation shall have heard the gospel.

MISSISQUOI, a co. in s. Quebec, having the state line of Vermont for its s. boundary, and the n. portion of lake Champlain, called Missisquoi bay, and the Richelieu river for its s.w. boundary; 560 sq.m.; pop. 16,922. It is traversed in the extreme e. by the Southeastern and Montreal railway, which in the extreme n. forms a junction with the Stanstead, Shefford and Chambly, and the Chambly and Sorel railroads. The Central Vermont railroad crosses the extreme s.w. section on the shore of the lake. Its county seat is a port of entry. It has saw and grist mills, and beds of iron ore, brick-yards, and manufactories of various kinds. Capital, Frelighsburg.

MISSISSA'GAS, a tribe of Indians belonging to the Algonquin nation, who, when first known by the whites, lived n. of lake Huron on a river since called by their name. After the defeat of the Hurons by the Iroquois, they moved to the region of lake Superior, but after a few years returned. Until the French and Indian war broke out they were constantly engaged in warfare with the Sioux, and were driven eastward to the Thousand islands. At first friendly to the French, they were in 1746 gained over by the Six Nations, and for a time sided with the English; but in the second war, feeling themselves ill-treated by their white allies, again joined the French; when the Pontiac war began they once more assisted the English, but in the Miama war (1792) and in the war of 1812 showed themselves hostile to the Americans. For a short time they lived near the present site of Erie, but have long been settled in Canada, occupying four villages in Ontario. Missions were established among them as early as the latter part of the 17th c., but only within the last 50 years has Christianity made much progress among them. They are now, however, well advanced in religion and civilization, till the land, live in houses, and have schools. They number between 500 and 1000.

MISSISSIPPI, one of the south-western states, lies in lat. 30° 13' to 35° n., and long. 88° 7' to 91° 41' west. It is 332 m. from n. to s., and from 78 to 118 m. from e. to w., containing an area of 47,156 sq. miles. It is bounded n. by Tennessee, e. by Alabama, s. by the gulf of Mexico and e. Louisiana, and w. by the rivers Pearl and Mississippi. The state also includes a cluster of islands in the gulf, of which the principal are Horn, Deer, and Ship islands. There are 73 counties. The principal towns are Jackson (the capital), Natchez, Vicksburg, and Columbus. There are 88 m. of sea-coast, but no good harbors. The surface is undulating, and generally very fertile, with river-bottoms of great productiveness. The sea-coast is sandy, but well timbered with live oak, magnolia, and pine, and is considered one of the most healthy districts in the world. The state borders for 500 m. on the Mississippi, and is drained by its tributaries, the Yazoo, Black, Sunflower, etc., and by the Pearl and Pascagoula, flowing into the gulf of Mexico. The country is of the tertiary and upper secondary formations, with great alluvial valleys; the climate, semi-tropical; the chief productions: cotton, sugar, maize, wheat, sweet potatoes, peaches, figs, oranges, etc. In its forests are found the deer, puma, bear, wolf, wildcat, paroquets, wild turkeys, and pigeons, with fish and alligators in the rivers. The state is well provided with railways, and has immense wealth and resources. Mississippi had in 1870 a population of 827,922. It has the largest cotton-growing area in the union; in 1877 no less than 2,055,000 acres. In 1877 the state debt was $2,954,458; the income was $865,327. Mississippi has a university, four colleges, and many benevolent institutions. This region was traversed by De Soto in 1542. La Salle descended the Mississippi in 1682, and claimed the country for France; in 1698 M. d'Iberville formed settlements on the coast at Ship island and Biloxi. Natchez was settled in 1700; but in 1728 this settlement was destroyed by the Natchez tribe of Indians, who were afterwards defeated, and the survivors sold into slavery in St. Domingo. Mississippi was admitted to the union in 1817; it seceded in 1861, and joined the southern confederacy. In 1869 Mississippi agreed to the new constitution, and was restored to its place in the union. In 1863 the city of Vicksburg, after a long and gallant defense, was forced, by famine, to surrender to gen. Grant; and Jackson, the capital, was taken and partially destroyed by the federals, and some of the finest regions of the state laid waste.

MISSISSIPPI (*ante*). In 1539 Fernando de Soto, with a band of Spanish adventurers, penetrated into that part of the state now known as the Great Yazoo bottoms, remaining more than a year. It was not until 1673, a hundred and thirty-two years later, that the French explorers, Joliet and Marquette, passing down the Mississippi river, landed at several places within the limits of the state. In 1682 De la Salle and the chevalier de Tonti made their appearance among the Natchez Indians, and remained for some time. It was not, however, until 1699 that the first attempt to found a colony was made by Iberville, who brought 200 immigrants from France to the eastern shore of the bay of Biloxi. The place was called Biloxi, and it was the germ of the subsequent settlement of New Orleans and of the dominance of the French in that quarter. Iberville, after returning to France, came back in 1716 with Bienville and the chevalier de Tonti, a large body of immigrants, and a military force, and ascended the Mississippi to the present site of Natchez, where they founded a colony named Rosalie, in honor of the countess of Pontchartrain. It flourished for a little while, but in 1718 it fell with the whole region under the sway, for a time, of the Scotch speculator, John Law. Afterwards, when the "Louisiana bubble" had burst, the whole territory of Orleans fell into the hands of the Company of the Indies, and the small colonies in Mississippi grew but slowly. Bienville, the governor of the province, was so fortunate as to keep on good terms with the powerful Indian tribes, but his successor, Perrier, incurred the hostility of the Choctaws, and a conspiracy was formed by that tribe with others to expel the French from the whole region. The attack was made first upon Rosalie, Nov. 29, 1729, but the other settlements were assaulted nearly at the same time. At fort Rosalie 200 persons were killed, and more than 500 taken prisoners, while in the smaller settlements many were tortured and ruthlessly butchered. But a swift retribution followed. The French commander at New Orleans pursued the Indians to their strongholds, killed many, destroyed much property, released the captives, and took 427 prisoners, among them several chiefs. These prisoners were sent to San Domingo and sold for slaves. The Company of the Indies having abandoned the territory to the king of France, Bienville, in 1733, was again made governor. He found the colony at war with the Chickasaws, and the conflict continued several years. Then there was a peace, followed in 1752 by another Indian war, instigated, it was said, by English adventurers. The French commander sought to retaliate, but without much success. In 1763 the whole region was ceded by France to England, after which immigrants flocked thither in considerable numbers from the English colonies on the Atlantic coast. In 1798, the United States having succeeded to all the rights of the English in this region, the territory of Mississippi, embracing all the region between the 31st and 35th parallels, was organized. In 1811 the portion of Mississippi below the 31st parallel, being a portion of the Louisiana purchase, was added to the territory. In 1817 Alabama was set off from Mississippi, and the latter was admitted to the union as a state in December of that year.

A broad, low ridge, running nearly n. and s. through the center of the state, divides the waters flowing into the Mississippi from those which find their way to the Atlantic through other channels. This ridge has a lateral extension westward to Vicksburg on the Mississippi, where it terminates in high bluffs. The country east of this water-shed consists of broad, gently rolling prairies, which produce heavy crops of cotton and corn; while on the w. the land is broken into valleys and ridges, extending at right angles from the longitudinal ridge, and falling gradually off to the great basin of the Yazoo delta, a region embracing 4,000,000 acres of the very best cotton land in the state. The land in the central ridge, which is partly cultivated and partly covered by heavy forests, is rolling, and of a lighter, but yet productive, surface soil on a clay foundation. The s.e. corner of the state, below the railroad from Meridian to Jackson, is a rolling, sparsely settled country of open pine woods, stretching down to the Mexican gulf, and valuable mainly for pasturage, timber, and turpentine. There is not a mountain in the state, and the highest ridge has no elevation of more than 800 feet. The Yazoo basin, with an exception of some 200,000 acres, is subject to overflow at times of extreme high water. The valley areas of the n. section are fertile, while those of other parts of the state are often of an inferior quality. The bottom-lands in some cases are clayey and wet, and portions of the prairies are not very fertile.

The state is well watered. The Mississippi forms the whole of its w. boundary, and into it flow the Homochitto, Big Black, Yazoo, and its tributaries, the Sunflower and the Tallahatchie. On the e. side of the central water-shed are the Pearl and its branches and the Pascagoula and Tombigbee, with their affluents, all of which flow at last into the gulf, on which the state has a coast line of about 90 m., with no good harbor except that of Ship island. In the extreme n.e. corner the boundary for 15 m. is the Tennessee river, into which flow several small streams. The principal ports on the Mississippi are Vicksburg and Natchez.

The mineral deposits are not of much value. In the tertiary formations coal is found in small quantities, with mineral fertilizers of some value, fire-brick and potters' clays, limestone, etc. Iron is found in some places, but nowhere in quantities to be of practical worth. The principal fossil found in the prairie region is a marine animal more than 100 ft. long, resembling the alligator. Mineral and medicinal springs are of frequent occurrence, that of Cooper's wells being the most important.

The summers are long and hot, but not unhealthful, save in the low bottom-lands. The winters, which of course are short, are somewhat damper and colder than on the coast. From October to June the climate is delightful. The highest temperature of the summer is 90°; the lowest of winter 18°. The mean annual temperature at Vicksburg varies from 64° to 67°.

A large portion of the state is covered with primitive forests. The principal deciduous trees are numerous species of oak, hickory (four species), black walnut, butternut, dogwood, black and sweet gum, beech, sycamore, cottonwood, red maple, ironwood, locust, papaw, and black and white mulberry. The principal evergreens are the pine (several species), the cypress, and the live oak. The fruits most cultivated are apples (in the n.e.

part of the state), grapes, peaches, pears, quinces, apricots, and plums; in the southern counties, figs, lemons, oranges, and bananas.

In the forests wild animals abound; among them wolves, bears, foxes, wildcats, panthers, raccoons, opossums, deer, rabbits, hares, squirrels, gophers, etc. Wild-turkeys, pigeons, quails, rice-birds, mocking-birds, and wild-ducks are found in great numbers. Hawks, vultures, and gulls, and birds of gay plumage are numerous. Alligators haunt the bayous of the Mississippi, and lizards and water-snakes are found in the swamps and bottom-lands. Rattlesnakes and moccasin-snakes, as well as a great variety of harmless reptiles, abound. Mississippi sound and the various rivers contain a great variety of edible fish. Oysters and other shell-fish are found in Mississippi sound.

Cotton and corn are the great agricultural staples, though wheat and oats do well in the upland regions. Excellent pasturage, with roots for swine, is found in the low-lands and in the river valleys. According to the census of 1870 there were 13,121,113 acres of land in farms, of which 4,209,146 acres were cultivated, while 8,911,967 acres were unimproved. The cash value of farms was $81,716,576, of farming implements $4,456,633. The estimated value of all farm products for the year was $73,137,953. The wheat crop was 274,479 bush.; the corn crop, 15,637,316 bush.; the oats crop, 414,586 bush.; the cotton crop (larger than that of any other state), was 564,938 bales; the wool clip, 288,285 lbs.; the rice crop, 374,627 lbs.; cane-sugar, 49 hogsheads; cane-molasses, 152,164 gals.; sorghum-molasses, 67,509 gals.; Irish potatoes, 214,189 bush.; sweet potatoes, 1,743,432 bush.; peas and beans, 176,417 bush.; beeswax, 9,390 lbs.; honey, 199,581 lbs.; butter, 2,613,521 lbs.; cheese, 3,099 lbs.; milk sold, 17,052 gallons. Value of live stock, $29,940,238; number of horses, 90,221; mules and asses, 85,886; milch cows, 173,889; working oxen, 58,156; other cattle, 269,030; sheep, 232,732; swine, 813,381. The corn crop of 1873 was 18,543,000 bush., valued at $15,761,550: wheat, 189,000 bush., $330,750; oats, 492,000 bush., $423,120; Irish potatoes, 206,000 bush., $247,200; tobacco, 85,000 lbs., $14,450; the cotton crop about 600,000 bales, $28,500,000. Within the last few years a new industry, that of raising early fruit and vegetables for the Chicago and other north-western markets, has sprung up. The center of this industry is at Crystal Springs, where the soil and climate are peculiarly favorable for the purpose. Already the trade has become profitable, and it will probably be much extended in future. The agricultural department at Washington, Jan. 1, 1874, estimated the number of horses in the state at 88,300, valued at $7,682,100; mules and asses, 99,000, $10,793,990; milch cows, 180,100, $3,886,558; oxen and other cattle, 329,800, $4,053,242; sheep, 153,600, $296,448; swine, 819,100, $2,858,659; total value of live stock, $29,000,000. One of the greatest impediments to the agricultural prosperity of the state is the frequent inundation of its alluvial lands by the overflow of the Mississippi. This can be prevented only by the construction of costly levees. Mississippi and Louisiana have expended millions of dollars for this purpose: but the work is too extensive for their resources, and they propose, in view of the national importance of the Mississippi as a channel of commerce, that congress shall provide for its accomplishment at the nation's expense. Mississippi is not, to any great extent, a manufacturing state, though its natural facilities therefor are great. In 1870 there were in the state 1731 manufacturing establishments, mostly small, employing 5,941 persons, using $4,501,714 of capital, paying $1,547,428 in wages, and producing goods valued at $8,154,758. There were 156 saw-mills, employing 1643 persons, and producing lumber valued at $2,029,145; 45 flouring-mills, producing flour valued at $468,576; 85 wagon and carriage factories, producing $268,031. In 1873 there were 11 cotton factories, using 2,545 bales.

There were within the state in 1875, 1141 m. of railway, belonging to 12 different lines, with an aggregate capital of $1,878,163, and a funded indebtedness of $3,325,000.

The assessed valuation of property in 1870 was $177,278,890; the true valuation was supposed to be about $210,000,000. The debt of the state in 1874 (deducting $7,000,000 of bonds repudiated in 1842) was $3,558,629, of which $1,157,415 was due to the school funds. The receipts of the state treasury in 1874 (deducting $795,936 for uncurrent and unavailable funds, and $74,269 in the shape of certificates of indebtedness) amounted to $1,385,618; the disbursements to $1,238,140.

The state has three customs districts—Natchez, Pearl River, and Vicksburg. The direct foreign trade and the coasting trade are carried on entirely in the Pearl River district, of which the only port is Shieldsborough. The amount of foreign commerce in 1874, consisting mainly of exports, was $233,406; the number of vessels entered as engaged in that trades was 93, aggregating 22,523 tons; clearances, 94—tonnage, 20,249 tons; entrances in the coasting trade, 68—tonnage, 12,048 tons; clearances, 96—21,382 tons; total tonnage of all kinds, 76,202.

There were no national and but five state banks of deposit in Mississippi at last accounts; the five had an aggregate capital of about $550,000. Six savings banks have a capital of not far from $300,000. An insurance department was connected with one of the banks of deposit, and also with one of the savings banks, and there were 21 insurance companies of other states doing business in Mississippi.

According to the census of 1860, the population of the state was 791,305, of which 353,899 were white, 436,631 slaves, and 773 free colored. The slaves having been emancipated in suppressing the rebellion, the population of 1870 was 827,922, of which 382,896 were white, and 445,026 (including 16 Chinese and 809 Indians) were colored;

males, 413,421; females, 414,501; natives of the country, 816,731; persons of foreign birth, 11,191; persons of school age (5 to 20 years), 278,999; voters, 174,845. Pop. '80, 1,131,592.

The constitution of the state at the time of its admission to the union recognized the need of a good common-school system, and congress was asked for an appropriation of public lands to promote the object. Grants were accordingly made at different times, amounting in all to 10,697,882 acres, an amount equal to more than one-third of the area of the state. The proceeds of these lands, so far as they have been sold, have been mostly diverted from their legitimate object and lost by gross mismanagement. Indeed, before the rebellion there was no well-regulated system of common schools, or hardly an effort to secure such a boon, the policy of this as well as of the other slave states being unfavorable thereto. After the national troops gained a foothold in the state, northern benevolent societies began to establish schools, but they were attended mainly by the negroes. Appropriations from the Peabody fund and from the resources of the Freedmen's bureau were added to the contributions of the benevolent societies, and a beginning of a better educational system was made. After the state was reconstructed, the legislature enacted laws for the establishment of a common-school system, and since that time much has been done to carry those laws into effect. In 1878 an act was passed placing the schools under the management of a state board of education, a state superintendent, county superintendents, and local boards; providing that white and colored youth should not be taught in the same school-house, nor in school-houses nearer to each other than two and a half miles; that the Bible should not be excluded from the schools, and that the proceeds of land sold for taxes, from fines, forfeitures, breaches of penal laws, etc., should be set apart for the support of schools. Another act was passed making provision for a system of high schools. In 1878 the number of children of school age was 348,244, of whom 158,156 were white, and 190,088 were colored. Number of children in school, 205,855, of whom 100,676 were white, and 104,179 were colored. Average monthly enrollment, 171,226, of whom 82,566 were white, 88,660 colored. Average daily attendance: whites, 64,318; colored, 71,658; total, 135,796. Number of teachers: white, 2,948; colored, 1813; total, 4,761. Average monthly salary of white teachers, $28.02; of colored teachers, $26.92½. The total amount of state funds expended for schools in 1874 was $1,242,308, of which over $1,000,000 was raised by state tax. Nearly or quite as much more was raised by local taxation, and the legislature succeeded in saving from the wreck of the school-fund nearly $2,000,000. There were in the state in 1873, 8 high and 2 normal schools—one of the latter at Holly Springs in the n. section, and one at Tougaloo, near the center. The number of private schools in 1874 was 586, attended by about 13,000 pupils. Number of persons who could not read or write in 1870 was 349,813. The university of Mississippi at Oxford has classical, scientific, and law departments; while Alcorn university (colored) at Oakland has scientific and agricultural departments. There are, besides, Mississippi college (Baptist) at Clinton, Pass Christian college (Roman Catholic) at Pass Christian, Madison college at Sharon, Tougaloo university (unsectarian, but under Congregational auspices) at Tougaloo, and Shaw university (Methodist) at Holly Springs; and not less than nine colleges and seminaries for the instruction of girls, mostly under the patronage of different Christian sects—Methodist, Presbyterian, Baptist, Cumberland Presbyterian, and Episcopal.

The state has an institution for the deaf and dumb, and another for the blind, near Jackson, the capital. There are two orphan asylums at Natchez, both under Roman Catholic control, and there is a soldiers' orphans' home for children of confederate soldiers near Lauderdale Springs. The state hospital for the insane and the penitentiary are at Jackson.

According to the census of 1870 there were in the state 111 newspapers and periodicals, of which 3 were daily, 6 tri-weekly, 8 semi-weekly, 92 weekly, 2 semi-monthly, and 5 monthly.

The number of church organizations in 1870 was 1829, of church edifices 1800; value of church property, $2,360,800. The principal denominations, in numerical order, were: Methodists, Baptists, Presbyterians, Cumberland Presbyterians, Episcopalians, Roman Catholics, and Lutherans.

The state is divided into 79 counties. The governor, lieutenant-governor, and other state officers, are elected for a term of four years; and the legislature, meeting biennially, is composed of a senate and house of representatives—the members of the former elected for four and those of the latter for two years. The supreme court is composed of three judges, appointed by the governor, by and with the advice and consent of the senate, for a term of nine years. The circuit court is composed of 15 judges (corresponding with the number of judicial districts), appointed by the governor, by and with the advice and consent of the senate, for a term of six years. The judges of the court of chancery, 20 in number, are appointed by the governor for four years. The salaries of the supreme court judges are $4,500 each; those of the circuit court judges are $3,500, and those of the chancery court judges $3,000.

The electoral votes of Mississippi for president and vice-president of the United States have been cast as follows: 1820, 2 for Monroe and Tompkins, 1 vacancy; 1824, 3 for Jackson and Calhoun; 1828, 3 for Jackson and Calhoun; 1832, 4 for Jackson and Van Buren; 1836, 4 for Van Buren and R. M. Johnson; 1840, 4 for Harrison and Tyler;

1844, 6 for Polk and Dallas; 1848, 6 for Cass and Butler; 1852, 7 for Pierce and King; 1856, 7 for Buchanan and Breckinridge; 1860, 7 for Breckinridge and Lane; 1864, did not vote; 1868, 7 vacancies; 1872, 8 for Grant and Wilson; 1876, 8 for Tilden and Hendricks; 1880, 8 for Hancock and English.

MISSISSIPPI, a co. in n.e. Arkansas, having the Mississippi river for its e. boundary, separating it from the state of Tennessee, the river St. Francis and lake St. Francis for its s.w., and the state line of Missouri for its n. boundary; 900 sq.m.; pop. '80, 7,332—7,230 of American birth, 2,661 colored. It is drained by Little river, the Obion, and several lakes of considerable size, the largest being Big lake. Its surface is generally level, but diversified by cypress swamps, bayous, canebrakes, and thick forests. Its soil wherever tillable is fertile and adapted to the production of cotton and corn, stock raising being carried on to a limited extent. Capital, Osceola.

MISSISSIPPI, a co. in s.e. Missouri, having the Mississippi river for its e. and n. boundary, separating it from Kentucky; 370 sq.m.; pop. '80, 9,270—9,020 of American birth, 2,141 colored. Its surface is generally level, diversified by sloughs and low swampy sections covered with a thick growth of cypress trees, and having small lakes, and James and Cypress bayous in the s. section. The soil under cultivation produces wheat, oats, Indian corn; pork is among the staple products, and horses, cattle, sheep, and swine are raised. It is intersected by the Cairo and the Belmont divisions of the St. Louis, Iron Mountain and Southern railroad, centering at its co. seat, and it contains in the s.e. section the town of Belmont, the first battle-field on which gen. Grant had chief command. Capital, Charleston.

MISSISSIPPI RIVER (Indian, *Miche Sepe*, Great river, literally, Father of Waters), a river of the United States of America, the principal river of North America, and, including its chief branch, the Missouri, the longest in the world, rises in the highlands of Minnesota, in a cluster of small lakes, and near the sources of the Red river of the north, and the rivers which flow into lake Superior, in lat. 47° 10' n., long. 94° 54' west. Its sources are 1680 ft. above the gulf of Mexico, into which it enters. Its general course is southerly, with numerous windings, giving it a length of 2,986 m. to its mouths, in lat. 29° n., long. 90° w., from which, to the source of the Missouri, is 4,506 miles. The Mississippi and its branches drain an area of 1,226,600 sq. miles. It is navigable to the Falls of St. Anthony, 2,200 m., and by smaller boats above the falls; or by the Missouri, 3,950 m., and has 1500 navigable branches, the chief of which are the Red river, 340 m. from its mouth; the Yazoo, 534 m.; the Arkansas, 700 m.; the Ohio, 1053 m.; the Missouri, 1253 miles. The Mississippi river forms a portion of the boundaries of ten states, having the southern part of Minnesota, Iowa, Missouri, Arkansas, and most of Louisiana on the w. bank; and Wisconsin, Illinois, Kentucky, Tennessee, and Mississippi on the east. The chief towns situated on its banks are New Orleans, Natchez, Vicksburg, Memphis, St. Louis, Quincy, Keokuk, Galena, St. Paul. The upper Mississippi, above the junction of the Missouri, flows through a picturesque and beautiful country. The great lower valley is 500 m. long, and from 30 to 50 wide. The delta, through which flow its numerous bayous, is 150 m. wide. The alluvial plain through which the river winds has an area of 31,200 sq.m., and the delta 14,000 sq.m., all of which, except a few bluffs, is protected by levees, or embankments, from frequent inundations. The descent of the plain is 320 ft., or 8 in. per mile. The river at high water is higher than the plain, and the banks higher than the swamps of the interior. The great floods rise 40 ft. above low water at the head of the plain, and 20 ft. at New Orleans, and for the whole distance the river averages 3,000 ft. wide, and is from 75 to 120 deep. There is no apparent increase from the largest branches, and it is estimated that 40 per cent of the floods are lost in the great marshes. Thousands of acres of land upon the banks are annually carried away by the current, with their growth of timber.

MISSISSIPPI RIVER (*ante*). The sources of this great river are lakes Itasca, Travers or Pemidgi, Cass, Winnebigoshish, Fishing, Leech, and Mud, lying among hills of drift and bowlders, in the midst of pine forests and marshes. From lake Itasca to Travers the stream is about 12 ft. wide and 2 ft. deep. It issues from the latter 120 ft. wide to Cass lake, which it leaves with a width of 172 ft., contracting and deepening below as it flows through marshes till it comes to a junction with Leech river, where it has rapids of 20 ft., called the falls of Pecagama, 270 m. from the source. To this point small steamers navigate. The total descent to this point is 324 feet. Thence to the mouth of Pine river, about 200 m., the river falls 165 ft.; thence to Crow-wing river 47 m., one ft. per mile. The river is narrow through this distance and winds through oak and maple forests, marshes, and sandy hills, where the natural formation of rock is overlaid with the gravel and bowlders of the drift period. Below, the river passes through a prairie country down to Elk river, and is stained slightly with the brownish color given by piney and marshy vegetation; 133 m. below the Crow-wing are the Sauk rapids one m. long, where the first regular formation of rock is seen on its banks. This is of the Potsdam sandstone, which extends from that point down to Dubuque and Rock Island. The falls of St. Anthony at Minneapolis are only 18 ft., with a breadth of 1200. Up to this point the river is navigable for commercial purposes, widening below from what is called lake Pepin, studded with many islands. From above the falls of St. Anthony to the junction with the Missouri, the river flows through a valley of great beauty and uniform fertility. Cliffs and rocky bluffs, from 200 to 300 ft. high, give a picturesque character to that part of the valley below Rock Island, where its strikes the carboniferous strata, the geological formation of the valley, to about 100 m. below the Missouri. At Rock Island, 350 m. below St. Anthony, there is a fall of 22 ft., and the Des Moines rapids, 475 m. below St. Anthony's, have a fall of 24 ft. The government has constructed ship canals around these rapids, so that the navigation of the upper Mississippi is uninterrupted below the falls of St. Anthony. The junction of the Missouri is like the marriage of a rough impetuous uncouth man with a refined and graceful woman. The surging, muddy, eddying waters of the greater stream, the Missouri, for a long distance flow side by side with the clear waters of the Mississippi, joining but not blending, till thrown together by many a crook and turn and eddy between. the bluffs of the great valley. Before the Ohio river joins, the union is complete; but the waters remain turbid to their junction with the sea, and, where joined by the currents of the Arkansas and Red rivers, take a more reddish color. Three m. above cape Girardeau and about 30 m. above the mouth of the Ohio, the river begins to have a surface above much of the adjacent land; and for 1300 m. to the sea it flows over a vast alluvial deposit of its own creation, below the surface of which its tortuous bed is deeply cut, while the top of its current is higher than the land.

The mean annual velocity of the current below the junction of the Missouri is 3.39 ft. per second—about 2¼ m. an hour. The average annual rain-fall in its basin is estimated at 30.4 in.; and the yearly discharge of water into the gulf of Mexico at 145 cubic miles. The depth of the channel below the mouth of the Ohio is from 75 to upward of 100 feet. The variation from lowest to highest water at Natchez, Vicksburg, and Cairo was formerly 52 ft., but is supposed to have been reduced to 46 ft. by new channels and levees. The sediment contained in the water below the Missouri is .0035 of its volume. The area of the delta of the river is estimated at 38,600 sq. miles. The entire valley of the river is margined by deltas, and considerable parts of Louisiana, Mississippi, and Arkansas are all delta. The bottom-lands above cape Girardeau, which are occasionally overflowed, but which are clearly above the level of the river at ordinary stages, are to be distinguished from those large tracts adjoining the lower part which lie below the surface of the river at all seasons. The former are almost continuous on one side of the river or the other, and generally on both sides, from the falls of St. Anthony to three m. below cape Girardeau, where the surface is so low as to be subject to overflow in all seasons, save where defended by levees. These bottom-lands, both high and low, are of the highest order of fertility; those farthest north being used for corn (maize) principally, and for tobacco and pasturage. Some of the largest have been reclaimed from liability to overflow by dikes across the water-channels by which they were inundated. Sny island in Pike co., Illinois, so reclaimed, is 40 m. in length. The American bottom extends from the mouth of the Missouri 90 m. down the river, with an average breadth of 6 miles. Below cape Girardeau (about 30 m. above the mouth of the Ohio), on the w. side, the whole country down to the gulf is mostly delta for an average width of 50 m.; and in high floods the river formerly overflowed nearly all the surface between the mouth of the Ohio and the St. Francis rivers in s.e. Missouri and eastern Arkansas, filling the lakes and lagoons of that region, and then flowing by numberless channels to the White river and Arkansas valleys, the bayou Macon, Washita, Red and Atchafalaya rivers into the gulf. This region is made safe from floods and habitable only by levees. The Louisiana delta has been for a hundred years to a considerable extent reclaimed by levees. The great delta on the east side, embracing the whole area between the Mississippi and the Yazoo, about 60 m. in width, has been partially protected for about 50 years, while the protection of the upper portion above Memphis is a more recent undertaking.

The first attempt to guard the lower part of the valley against the river floods was in 1717, when the French governor, De la Tour, ordered embankments for the protection of New Orleans. In 1728 the French planters of Louisiana were protecting each his own water-front, and soon after combined for joint work by neighborhoods and parishes. In 1828 the state of Louisiana began to take rigorous action for the more complete protection of its delta lands. In 1836 and 1838 several of the great side channels by which inundations had come were closed at the expense of the counties, and the question of the closing of all the overflow channels, so as to confine the stream to one bed in all stages of water, was the subject of much excited difference of opinion. The closure party prevailed, and one by one the side outlets of the Mississippi were cut off by levees, so that by 1844 every old river lake inlet for 600 m. up the w. bank had been effectually closed. The results were even more satisfactory than had been expected, so that the levee system was entered upon with increased spirit by the states bordering the river, and the aid of the general government was invoked to unify the work. Congress, in 1850, ordered thorough topographical and hydrographic surveys of the whole Mississippi delta, under the direction of capt. A. A. Humphreys and lieut. H. L. Abbott, who began work immediately; but the report was not submitted until Aug., 1861. While the U. S. government were thus obtaining complete data for the completion of the whole work, not only with reference to the reclamation of the vast and fertile deltas of the river, but with reference to the thorough improvement of its navigation from the gulf to its upper waters, the states most interested in the levees continued work upon them till checked by the operations of the rebellion in 1862–64. By the report of Humphreys and Abbott, in 1861, it appears that substantial levees had been constructed on the e. side up to the n. line of the state of Mississippi, including one of great magnitude across the Yazoo pass—the largest of all the outlets closed; and that above on the e. side none of great magnitude were required. On the w. side the levees had been completed to the mouth of the Arkansas, and were partially completed, including the line 25 m. long opening into the St. Francis valley.

This was the condition of the lower Mississippi at the beginning of the rebellion. Louisiana alone had expended up to that time $18,000,000 on the levees of the main river; $5,000,000 more on its great side outlets, the Atchafalaya, Plaquemine, and La Fourche; and $1,000,000 on the shore of the Red river. The state of Arkansas had spent $1,000,000; Mississippi, on her water-front of 444 m., $14,500,000; and the state of Missouri, on her front of 140 m., $1,640,000. The total expenditure by individuals, parishes, and states up to that time, on about 2,000 m. of the river shore, is estimated by C. G. Forshey, of New Orleans, at upwards of $41,000,000, without counting the cost of its maintenance. The report of Humphreys and Abbott, in 1861, recommended confining the river to a single channel and making the levees higher at all points, and relatively as follows: at the mouth of the Ohio, 3 ft. above the highest flood ever known (which was then that of 1858); 7 ft. above from Osceola to Helena; 10 ft. above from Helena to island No. 71; thence down to Napoleon 8 ft.; thence to Lake Providence to be increased to 11 ft.; thence to the mouth of the Yazoo and Red River Landing to be reduced to about 6 ft.; and below to be reduced gradually to 3 ft.; and they estimated the cost of carrying out this recommendation at $17,000,000. The tendency of all streams to build up the level of their bottoms by bars formed at their mouths was met by a recommendation to construct a jetty system at the main mouth of the Mississippi, by which its depth should be increased and maintained.

The subject of levee construction was again taken up by the U. S. government by an act of June 22, 1874, authorizing president Grant to appoint a board of commissioners to make a full report on the best system for the permanent reclamation of the delta basin of the Mississippi. Maj.gen. G. K. Warren and gen. Humphreys were put at the head of the commission, and reported, Jan. 22, 1875, substantially the recommendation of the preceding report, carried further up the great tributaries of the lower Mississippi; that the general government should make and enforce the laws necessary to execute and protect the work; and that the work should be divided "into six natural drainage districts, viz.: 1. The St. Francis bottom-lands, comprising the w. bank of the river from Cape Girardeau to Helena; 2. the White river bottom-lands, lying between Helena and the mouth of the Arkansas; 3. the Tensas bottom-lands, extending from the Arkansas to the Red river; 4. the Yazoo bottom-lands, lying between the bluffs below Memphis and Vicksburg on the e. bank; 5. Louisiana below Red river on the w. bank; and 6. Louisiana below Baton Rouge on the e. bank. In each of these districts the commission recommended the appointment of a single controlling engineer, with full power in his district, subject to the control of a board composed of the chiefs of each department. The cost of the entire work recommended by this commission by districts was as follows:

ESTIMATES FOR PERMANENT SYSTEM OF LEVEES.

DISTRICT.	Cubic yards.	Cost at 40 cts. per cubic yard.
St. Francis bottom-lands	17,265,000	$6,906,000
White river bottom-lands	4,652,000	1,760,800
Yazoo bottom-lands	31,188,000	12,575,200
Tensas bottom-lands	36,690,000	14,676,000
Louisiana below Red river, w. bank	15,114,000	6,045,600
Louisiana below Baton Rouge, e. bank	9,865,000	3,946,000
Total	114,774,000	$45,909,600

The annual cost of maintenance is estimated at $2,000,000. The length of levees estimated on is 1775 miles.

The commissioners state the amount of land reclaimed and to be reclaimed by this system "at least 2,500,000 acres of sugar land, 7,000,000 acres of the best cotton land in the world, and not less than 1,000,000 acres of corn land of unsurpassed and inexhaustible fertility." Other authorities place the area that will be reclaimed as high as 23,000,000 acres of good land. This probably includes the swamps that may be subsequently reclaimed.

The three main mouths or passes of the river to the gulf diverge where the river has treble its mean width, that is about 7,500 ft., with a mean depth of about 26 feet. It is through the South pass that the recent great work of the government under capt. Eades has been done to deepen and confirm the main channel, and prevent the rise in the level of the bottom of the river. The outer edge of the bar formed at the mouth of the South pass since 1838 was found to have pushed into the gulf about 300 ft. a year. The depth of the gulf at the foot of the slope formed by the deposits of the river is from 300 to 500 ft., the course of the main or South pass being direct towards its deeper waters.

The report from which these facts are drawn is published under the title of the

Report upon the Physics and Hydraulics of the Mississippi River, by capt. A. A. Humphreys and lieut. H. L. Abbott; Philadelphia, quarto, 1861.

The expenditures of the general government on the Mississippi have been as follows:

Mouth of the Mississippi, 1836–56	$690,000
Above the mouth, 1836–56	465,000
Mouth of the Mississippi, 1856–75	1,224,000
Between Illinois and Ohio rivers	665,000
Des Moines rapids	3,028,200
Rock Island rapids	1,039,650
Upper Mississippi and falls of St. Anthony	677,640
Mouths of the Mississippi, June 1, 1875, to June 1, 1879	3,158,108
Other parts of the river during the same time	1,561,100
Total	$12,508,698

The following table gives the relative expenditures in several portions of the river since June 1, 1875:

YEAR.	Mississippi, lower part of.	Upper Mississippi, miscellaneous.	Mississippi, Missouri, and Arkansas.	Rock Island Rapids.	Des Moines Rapids.	Falls of St. Anthony.
1876	$233,108	$19,000	$85,000	$50,000	$481,000	$100,000
	115,000	....	....	....	....	....
1877	121,000	25,000	70,500	15,000	165,000	93,000
	....	1,500	....	....	....	....
	20,000	25,000	....	....	....	....
	500,000	25,000	....	....	....	....
1878	75,000	20,000	70,200	10,000	65,000	20,000
	1,000,000	4,600	....	....	....	....
	....	13,500	....	....	....	....
1879	15,000	20,000	70,200	10,000	65,000	20,000
	79,000	4,600	....	....	....	....
	1,000,000	13,500	....	....	....	....
Totals	$3,158,108	$171,200	$295,900	$85,000	$776,000	$233,000

Total expenditures for four years ending June 1, 1879, $4,719,208.

The deltas of the lower Mississippi are everywhere threaded with interlacing bayous and navigable channels, placing every cultivable acre of their lands near to steamboat navigation, one-tenth of the land being estimated as taken up by such water surfaces or channels. Below lat. 31° 30′ the sugar-cane is grown on the delta only. Cotton is grown nearly the entire length of it, but most advantageously north of lat. 31°. Corn and sweet potatoes are grown in every part of its whole area, and in the northern parts potatoes and the cereals do well.

The timber growing in the delta region of the Mississippi is mostly sycamore, cypress, and oak—the former margining the streams, the cypress occupying the swamps, and the oaks the lands not liable to frequent inundation, the live oak being principally found within a few hundred miles of the gulf.

The climate of the Mississippi valley ranges from semi-arctic to semi-tropical. At the falls of St. Anthony, and above, spirit thermometers must be employed to register the extreme low temperature in winter, which often touches 40° Fahr., and yet the extreme of summer heat is but a few degrees less at St. Paul than at New Orleans, 97° to 104°. The range between the extremes is about 65° more at the source than at the mouth of the river. The annual mean temperature at New Orleans is 69°; at Cairo, 45°.

For the history of the discovery and first settlements of the Mississippi, see DE SOTO; MARQUETTE; LA SALLE; IBERVILLE; NEW ORLEANS; ST. LOUIS; ST. PAUL, etc. For commerce of the Mississippi, see NEW ORLEANS; MEMPHIS; and ST. LOUIS. FOR improvements at the mouth, see JETTY.

MISSISSIPPI RIVER, IMPROVEMENTS AT THE MOUTH OF. See JETTY.

MISSISSIPPI SCHEME. The gigantic commercial scheme commonly known by this name was projected in France by the celebrated John Law (q.v.) of Lauriston, in 1717 and collapsed in 1720. Its primary object was to develop the resources of the province of Louisiana and the country bordering on the Mississippi, a tract at that time believed to abound in the precious metals. The company was incorporated in Aug., 1717, under the designation of the *company of the west*, and started with a capital of 200,000 shares, of 500 livres each. They obtained the exclusive privilege of trading to the Mississippi, farming the taxes, and coining money. The prospectus was so inviting that shares were eagerly bought; and when, in 1719, the company obtained the monopoly of trading to the East Indies, China, the South seas, and all the possessions of the French East India company, the brilliant vision opened up to the public gaze was irresistible. The *Company of the Indies*, as it was now called, created 50,000 additional shares, but a rage for speculation had seized all classes, and there were at least 300,000 applicants for the new shares, which consequently rose to an enormous premium. Law, as director-general, promised an annual dividend of 200 livres per share, which, as the shares were paid for in the depreciated *billets d'état*, amounted to an annual return of 120 per cent. The public enthusiasm now rose to absolute frenzy, and Law's house, and the street in front of it, were daily crowded with applicants of both sexes and of all ranks, who were content to wait for hours, nay, for days together, in order to obtain an interview with the modern Plutus. While confidence lasted, a factitious impulse was given to trade in Paris; the value of manufactures was increased fourfold, and the demand far exceeded the supply. The population is said to have been increased by hundreds of thousands, many of whom were glad to take shelter in garrets, kitchens, and stables. But the regent had meanwhile caused the paper circulation of the national bank to be increased as the Mississippi scheme stock rose in value, and many wary speculators, foreseeing a crisis, had secretly converted their paper and shares into gold, which they transmitted to England or Belgium for security. The increasing scarcity of gold and silver becoming felt, a general run was made on the bank. The Mississippi scheme stock now fell considerably, and despite sundry desperate efforts, which were attended with momentary success, to keep up its credit, it continued to fall steadily and rapidly. In Feb., 1720, the national bank and the Company of the Indies were amalgamated, but though this gave an upward turn to the share market, it failed to put the public credit on a sound basis. Several useless attempts were made to mend matters; and those suspected of having more than a limited amount (fixed by a law passed at the time) of gold and silver in their possession, or of having removed it from the country, were punished with the utmost rigor. The crisis came at last. In July, 1720, the bank stopped payment, and Law was compelled to flee the country. A share in the Mississippi scheme now with difficulty brought 24 livres. An examination into the state of the accounts of the company was ordered by government; much of the paper in circulation was canceled; and the rest was converted into "rentes" at an enormous sacrifice.

MISSISSIPPI SOUND, a narrow strait washing the coasts of Alabama and Mississippi from Mobile bay to Pearl river—about 90 miles. It is formed and separated from the gulf of Mexico by several islands: Dauphin, Petit Bois, Horn, Ship, Cat, and the isle au Pied, the fifth of which is fortified. It is moderately deep, generally tranquil, and is navigated chiefly by the steamers and coasting vessels running between Mobile and New Orleans by the way of lake Pontchartrain.

MISSISSIPPI, UNIVERSITY OF, at Oxford, Lafayette co., was organized in 1848. By the liberality of the congress of 1819, two years after Mississippi had been admitted into the union, an entire township of the public domain within the state—23,040 acres—was granted to the state for the purpose of establishing a seminary of learning. The title to this land was, by act of congress, vested in the state legislature, *in trust*, for the support of the institution. The trust was accepted by the legislature, and, in pursuance of the spirit and intent of the act, "lands of great value" were selected by the state, and, in due time, 35½ of the 36 sections were sold. Upon this foundation the university was established, and, when it was located at Oxford, the citizens of Lafayette co. gave it a section of land as a site for its buildings. The endowment amounts to the sum of $540,000, and the annual income to more than $32,000. It has 10 buildings, which, with their contents, are valued at $300,000. The libraries contain over 6,000 volumes, which have been carefully selected with the view of supplying all the needs of classical, scientific, and law students. With physical, chemical, and electrical apparatus, and with cabinets of minerals, rocks, and shells, and other fossils, the university is well supplied. The geological department has a fine collection of accurate maps and charts, and geological reports of the various state surveys. The herbarium contains specimens of all the forms of vegetable life indigenous to Mississippi and some of the adjoining states. Zoology is rendered more interesting and intelligible by maps showing the geographical distribution of animals, and by a collection of vertebrates which is increased every year. This department also possesses maps showing the geographical distribution of plants. The university comprehends three general departments: 1. That of preparatory education; 2. That of science, literature, and the arts; 3. That of professional education, embracing for the present only a school of law, with 1 professor and 5 lecturers. The number of professors (1880) is 8; tutors, 3; 1 principal of high-school and 2 assistants; students in all the departments, including the preparatory, 392; alumni, 482. Alexander P. Stewart, chancellor.

MISSIVE, in Scotch law, is a memorandum. See MINUTE; LETTERS.

MISSOLONGHI, also MESOLONGHI, a small t. of Greece, in the government of Ætolia, on the northern shore of the gulf of Patras, 24 m. w. of Lepanto. It is chiefly memorable for the two sieges which it underwent during the war of independence in the early part of the present century. In 1822 it was invested by land and sea by the Turks, who, after a siege of two months, were compelled to withdraw. In 1826 it was again besieged by an overwhelming Ottoman force, and after ten months of resistance and suffering, its garrison, reduced from 5,000 to 3,000 fighting-men, cut their way through the ranks of the enemy, carrying with them a great number of the women and children. The Turks then entered the town, which was all but totally destroyed. Here lord Byron died in 1824. Pop. about 4,000.

MISSOU'LA, a co. in n.w. Montana, having the British possessions on the n., and the state line of Idaho for its w. and s. boundary; 20,091 sq.m.; pop. '80, 2,533—1843 of American birth, 610 colored. Its surface is diversified by river, lake, and mountain, having the Rocky mountains on the e. and the Bitter Root mountains on its w. border. It is drained by the head waters of Clarke's fork of the Columbia river, the Kootenay, the Maple, and the Bitter Root or St. Mary's rivers, and by Flathead lake, the largest body of water in the territory, 10 m. wide and 25 m. long. A large proportion is covered with timber, but the soil of the valleys, especially the Bitter Root, is remarkably fertile, producing wheat, barley, oats, potatoes, and dairy products. Fruit-trees are largely imported from the states, and grow with very little care. Live stock is raised in large numbers. Gold is abundant, and worked principally by placer-mining. County seat. Missoula.

MISSOURI, one of the United States of America, in lat. 36° 30' to 40° 30' n., and long. 89° 2' to 95° 52' w., being 277 m. from n. to s., and from 200 to 312 m. from e. to w., having an area of 67,380 sq.m., or 43,123,200 acres. It is bounded n. by Iowa; e. by the Mississippi river; s. by Arkansas; and w. by Nebraska territory, Kansas, and the Indian territory. Missouri has 114 counties. Its chief towns are Jefferson City (the capital), St. Louis, Kansas City, Hannibal, St. Joseph, Lexington. Its chief rivers are the Mississippi, which borders the state for 470 m.; the Missouri, which forms a portion of its western boundary, and passes through it from w. to e.; and its affluents, the Osage, Gasconade, etc. The country s. of the Missouri river is undulating, rising into mountains toward the borders of Arkansas; the northern portion of the state is level prairie-land, with rich bottoms, and high picturesque bluffs on the rivers. The geological formations range between the lower Silurian and upper coal. There are porphyritic rocks in the s.; in the center, coal-measures, with veins of an aggregate thickness of 500 ft., highly bituminous, and immense deposits of iron, with lead and iron in limestone formations. The winters are long and severe; the summers hot, with sudden changes. Much of the land is very fertile, producing maize, wheat, hemp, tobacco, the peach, nectarine, grape, etc. Cotton is grown in the southern counties. A large German population has introduced wine-making. The chief manufactures are ironworks, distilleries, and breweries. St. Louis has a large trade, and the western towns supply caravans or trains to New Mexico, Utah, and California. The counties and cities have appropriated $45,000,000 to railways, and in 1875 there were 3,036 miles completed, and several hundred under construction. There are 39 universities and colleges, several medical and ecclesiastical seminaries, 8,000 public schools with 370,000 pupils, and above 2,000 churches. Missouri was formerly a part of upper Louisiana. St. Genevieve was settled in 1755 by emigrants from Canada and Spain. St. Louis, a French trading-post, in 1775 had 800 inhabitants. The country was purchased by president Jefferson in 1803; and in 1821, after a great contest, was admitted into the union as a slave state, under what was called the Missouri compromise, which admitted Missouri, but prohibited slavery n. of the northern boundary of Arkansas, 36° 30' n. lat. In 1861 Missouri joined with the seceded states, and became a scene of civil war and violent partisan conflicts. Pop. in 1820, 66,586; in 1840, 383,702; in 1860, 1,182,317; in 1870, 1,715,000.

MISSOURI (*ante*) was a part of the vast territory claimed by the French as original discoverers and settlers, which, in the grant of Louis XIV. in 1712, was called Louisiana. The states of Arkansas, Iowa, Kansas, and Nebraska were also a part of this great region, the northern portion of which was called upper Louisiana. As early as 1720 the lead mines of Missouri attracted attention, but it was not until 1755 that the first settlement in the territory was made at St. Genevieve. In 1762 France ceded all that portion of the territory w. of the Mississippi to Spain, and that on the e. to England. In 1800 the region w. of the Mississippi was retroceded by Spain to France, and in 1803 it was sold by the latter to the United States. In 1755 St. Louis was known as a fur-trade station, with less than 1000 inhabitants, while St. Genevieve had about half that number. These and the smaller settlements grew very slowly until Louisiana and upper Louisiana alike came into possession of the United States. The vast region was then divided by congress into the territory of Orleans and the district of Louisiana—Missouri being included in the latter, which in 1805 was erected by congress into a territory, with St. Louis as its seat of government. In 1812, when a part of the territory of Orleans was admitted as a state to the union under the name of Louisiana, the name of the territory of Louisiana was changed to Missouri. The limits on the w. were enlarged from time to time by treaties with the Indian tribes. In 1810 the population numbered 20,845, of whom all but 1500 were within the present limits of Missouri. In 1817 the total population having increased to 60,000, while St. Louis was a town of 5,000 inhabitants, the territorial legislature asked leave of congress to frame a constitution with a view to the admission of the territory into the union as a state. This application led to a fierce excitement, not only in congress, but throughout the country. A very large number of the people of the free states were earnestly opposed to the admission of any more slave states to the union, while the people of the slave states were resolved that Missouri should not be excluded on this account. The subject was debated in congress with such heat that many citizens were alarmed lest it should lead to a dissolution of the union. Indeed, it was openly declared by some of the champions of slavery that the country would be disrupted and the national government overthrown if the petition of Missouri were rejected. These threats so terrified some of the northern representatives that they yielded to the southern demands, and Missouri was admitted to the union in 1820 under conditions set forth in what has ever since been known as "the Missouri compromise," and which, as an offset for the addition of another slave state to the union, solemnly enacted that the system of slavery should be forever excluded from all that part of the territory of the United States lying n. of 36° 30′. The admission was consummated by a presidential proclamation dated Aug. 10, 1821. The growth of the state was thenceforth rapid. At the time of the rebellion in 1861 the people were about equally divided in sentiment, one portion adhering to the union, the other to the southern confederacy. The struggle between these two parties was very severe. The friends of secession, having control of the state senate, induced that body to call a state convention, but the body so summoned proved favorable to the maintenance of the union, and the scheme of the secessionists was defeated. Union troops having entered the state in considerable numbers, gov. Jackson, June 12, 1861, issued a proclamation calling into service 50,000 of the state militia "for the purpose of repelling invasion, and for the protection of the lives, liberty, and property of the citizens." The governor, in thus assuming that the presence of the union troops was an "invasion" of the rights of the state, endangering the lives, liberty, and property of the citizens, proclaimed himself in rebellion against the national government. Gen. Lyon, with a force of 1500 men, having taken possession of Jefferson City, the capital, in the name of the United States, and gov. Jackson and the other secession state officers having fled, the state convention again assembled, and on July 30 filled with loyal men the vacancies thus created. On Aug. 1 the new governor (Gamble) was inaugurated, and on the 5th the deposed governor issued from New Madrid a proclamation that the state was out of the union. Confederate troops in large numbers having assembled in the s.w. part of the state, gen. Lyon advanced from Booneville to Springfield to resist them. A battle took place Aug. 10, in which gen. Lyon was killed. The union forces, under gen. Sigel, retired to Rolla. On Aug. 1 gen. Fremont, commanding the department of the west, declared martial law throughout the state. Aug. 20 the rebel general Price compelled the federal forces, numbering 3,000, to retire from Lexington. Fremont thereupon hastened from St. Louis to Jefferson City, but the confederates, numbering 20,000, under gen. Price, retreated to Springfield and still further south. Fremont thereupon moved to the s.w. in five divisions, under gens. Hunter, Pope, Sigel, Asboth, and McKinstry. Nov. 2 Fremont was succeeded by gen. Hunter, and on the 18th gen. Halleck took command of the western department. Meanwhile a quorum of the legislature elected before the contest began, having assembled at Neosho, Newton co., passed an act declaring the state to be a part of the confederacy. Early, however, in 1862 a strong federal force under gen. Curtis drove the confederates into Kansas. During the rest of the year the state was disturbed by a guerrilla war, kept up by secessionists who had not removed within the confederate lines. In the summer of 1863 the state convention elected in 1861, and which had been kept alive by successive adjournments, passed an ordinance providing for the emancipation of all the slaves of the state in 1870. In 1864 gen. Price again invaded Missouri, threatening St. Louis, and traversing a large part of the state; but he was soon driven back again to Arkansas. The first state election since the war was held Nov. 4, 1864, and on Jan. 6, 1865, a state convention assembled in St. Louis and framed a new constitution, which in the following June was ratified by the people by a vote of 43,670 to 41,808. During the war the state furnished to the federal armies more than 108,000 troops. In 1869 the legislature ratified, by a large majority, the 15th amendment to the constitution of the United States. The population of the state in 1875, according to a state census, was a little short of 2,000,000. Pop. '80, 2,168,804.

The Missouri river, flowing across the state from w. to e., divides it into two parts, the largest of which lies s. of that stream. This portion of the state presents a considerable variety of surface. Extensive bottom-lands lie along the Mississippi from cape Girardeau to the Arkansas river. In these lands are many lakes and lagoons, with islands never submerged by the highest floods. In them also are many almost impenetrable swamps, filled with heavy growth of cypress. The most notable of these is the Great swamp, extending from a point near cape Girardeau s. 100 m.; and then reaching far into Arkansas. These bottom-lands, if reclaimed and protected from overflow, would, no doubt, be highly productive. From a point a little below cape Girardeau, northward to the mouth of the Missouri, the Mississippi is bordered by highlands, which, between St. Genevieve and the Maramec, take the shape of solid limestone bluffs, rising from 250 to 360 ft. above the river. From these highlands westward across the whole state, the land is high and broken, but growing less precipitous as the Osage river is approached. In the s.w. part of the state are the Ozark mountains, or hills, lying not in continuous ranges, but in isolated knobs and peaks, rising occasionally from 500 to 1000 ft., and presenting occasionally perpendicular cliffs of sandstone. The river valleys are moderately fertile, but subject to overflow, while the soil upon the hills is shallow. This part of the state is but sparsely populated. The region n. of the Missouri, and bounded on the w. by the same stream, is generally level or undulating, except at points where it is intersected by the smaller rivers with their outlying hills. The bottom lands on the Missouri and the Mississippi are exceedingly fertile. Woodlands girt the streams, while the uplands are prairies, destitute of timber, but possessing a very productive soil.

The principal rivers of the state are the Mississippi and the Missouri; the former washing the entire e. boundary from n. to s., and presenting a shore line of 470 m.; the latter forming the w. boundary for nearly 200 m. from the Iowa line to Kansas City, at which point it turns eastward, flowing across the state in a tortuous course for more than 250 m. to the Mississippi. These great streams are navigable at all times, except when obstructed by ice. The Osage, one of the s. affluents of the Missouri, is navigable for small steamboats half the year. The St. Francis, White, Black, Current, Gasconade, Grand, and Chariton are navigable for small boats at high water, usually in early summer. Among the principal streams of the class not navigable are the Fabius, Salt, South Grand, Nodaway, Platte, Spring, Sac, Niangua, Cuivre, Piney, Maramec, and Castor rivers.

The mineral productions of Missouri are various and rich. Gold is found in the drift sands of the n., and silver in combination with lead in the galena and other ores. Iron in some form is found in every county, and in some places the supply is inexhaustible and of the richest quality. There are extensive bog ores in the s.e. part of the state, and the specular oxide is found in vast masses in the Iron mountain, Shepherd mountain, Simon mountain, Pilot Knob, and other places. Lead exists in immense quantities in two great fields, one in the s.e., the other in the s.w. part of the state. The lead production of Missouri is larger than that of all the other states of the union. Copper is also found in abundance in many places, and was formerly mined to a considerable extent, but since the discoveries of this metal on lake Superior these mines have been neglected. Nickel and cobalt are found at mine La Motte and the St. Joseph mines, and zinc is abundant in s.e. and s.w. Missouri. Carbonate of lime, gypsum, mica, hornblende, asbestus, bitumen, fire-clays, glass-sand, hydraulic lime and cement, polishing-stone, saltpeter, building-stone, granite, sandstone, marbles, etc., are abundant. The coal fields embrace about one-third of the whole area of the state. The coal is various in kind and quality, from common bituminous to the best cannel. Much of it is adapted to smelting purposes, and to the use of locomotives and stationary engines. There are in the state a great number of mineral springs, sulphurous, chalybeate, and saline. The salt springs of Howard county contain from 800 to 1200 grains of salt to the gallon.

The forests of Missouri are so extensive that wild animals are numerous. Among them are bears, panthers, wild-cats, wolves, foxes, raccoons, and opossums. Deer, rabbits, hares, and squirrels are abundant. Wild-turkeys, pigeons, quails, and prairie hens are in great numbers; song-birds and birds of gay plumage are numerous, and eagles, vultures, hawks, etc., prey upon the smaller birds. In the swampy regions on the Mississippi, wild-geese, ducks, herons, swans, etc., abound. Snakes, lizards, toads, frogs, and turtles are also numerous.

The climate of the state, with the exception of the river bottoms and swampy regions of the s.e., is generally healthful, though subject to great extremes of temperature. The summers are long, with a mean temperature of about 76°, the mercury sometimes marking 95°. The winters are cold and raw, with piercing winds, and a mean temperature of about 34°, sinking at times to 12°.

The soils of the state present a great variety. The alluvial deposits on the Mississippi and the Missouri are very rich and productive. The swamps, when drained, yield enormous crops. The prairies of the n.w. are very fertile, having lost little of their productive qualities after 30 years of culture. The mixed prairie and rolling lands n. of the Missouri, on the e. side, produce wheat and tobacco of the best quality. They are also good for fruits. The lands in the s.w. part of the state are good for grapes, peaches, pears, and apples, and for most of the cereals. The least productive soil in the state is in the region between s.w. Missouri and the swampy lands on the Mississippi. This region is traversed by the Ozark mountains, and much of it lies at an elevation of from 1200 to 1500 ft. above the sea. Some of the valleys are rich, but the hills are only moderately productive. Near the Arkansas line is a narrow belt of fair cotton land. Only about one-third of the area of the state is cultivated, and much of the uncultivated portion is heavily timbered. The trees most common are the cottonwood, hickory, black walnut, oak of many varieties, ash, walnut, sugar-maple, hackberry, elm, sassafras, dogwood, cedar, cypress, poplar, sweet gum, etc., and, near the Arkansas border, pine.

In 1870 there were in Missouri 21,707,220 acres of land in farms, of which 9,130,615 acres were improved and 12,576,605 unimproved. The estimated value of farms was $392,908,047; of farming implements and machinery, $15,596,426; value of farm productions, $103,035,759; of orchard products, $2,617,463; of market-gardens, $406,655; wages paid, $8,797,487; forest products, $793,343; value of home manufactures, $1,737,606; of animals slaughtered or sold for slaughter, $23,626,784; value of all live stock, $84,285,273; number of horses, 493,969; mules and asses, 111,502; milch cows, 398,515; working oxen, 65,825; other cattle, 689,355; sheep, 1,352,001; swine, 2,306,430. The wheat crop was 14,315,926 bushels; rye, 559,532 bushels; corn, 66,034,075 bushels; oats, 16,578,313 bushels; barley, 269,240 bushels; buckwheat, 36,252 bushels; tobacco, 12,320,483 lbs.; cotton, 1,246 bales; wool, 3,649,390 lbs.; peas and beans, 43,986 bushels; Irish potatoes, 4,238,361 bushels; sweet-potatoes, 241,253 bushels; hay sold, 615,611 tons;

milk sold, 857,704 gallons; clover seed, 2,494 bushels; hops, 19,297 lbs.; hemp, 2,816 tons; flax, 16,613 lbs.; flax seed, 10,391 bushels; wine, 326,173 gallons; butter, 14,455,825 lbs.; cheese, 204,090 lbs.; maple sugar, 116,980 lbs.; maple molasses, 16,347 gallons; sorghum molasses, 1,730,171 gallons; beeswax, 35,248 lbs.; honey, 1,156,444 lbs. In 1878 the live-stock statistics were: Mules, 191,900, valued at $8,324,622; oxen and other cattle, 1,632,400, valued at $24,382,080; swine, 2,817,000, valued at $6,226,896; horses, 627,300, valued at $25,022,997; cows, 516,200, valued at $9,188,360; sheep, 1,296,400, valued at $2,061,276; total value of live stock, $75,208,231.

The statistics of manufactures in the state in 1870 are as follows: Number of establishments, 11,871; persons employed, 65,354, of whom 55,904 were males above 16—3,884 females above 16, and 5,536 were below that age; capital invested, $80,257,244; wages paid, $31,055,445; products, $206,213,429. The principal branches of manufacture, with the value of their products respectively, were: Blacksmithing, $2,257,211; agricultural implements, $1,588,108; bags other than paper, $5,037,250; boots and shoes, $4,099,552; bakery products, $3,100,053; brick, $3,148,884; bridge-building, $2,072,620; carpentering and building, $15,561,086; railroad cars, $2,200,150; carriages, etc., $3,253,734; men's clothing, $7,271,962; women's clothing, $1,080,170; confectionery, $1,274,855; cooperage, $2,234,581; flouring and grist-mill products, $31,837,352; furniture, $3,303,024; iron, forged and rolled, $1,455,000; pig-iron, $2,991,618; iron castings, $1,182,255; stoves, heaters, and hollow ware, $2,981,350; distilled liquors, $6,519,548; lumber, planed and sawed, $7,220,452; sugar refined, $4,135,250; animal oil, $4,100,000; patent medicines and compounds, $2,073,875; printing and publishing, $3,837,250; saddlery and harness, $5,424,635; sash, doors, and blinds, $2,563,416; soap and candles, $1,794,100; tin, copper, and sheet-iron ware, $2,945,460; tobacco in all forms, $10,415,604.

The mining industries of Missouri, with their products respectively, in 1870 were: Coal, $2,011,820; iron ore, $491,496; lead, $201,885; stone, $767,312—total, $3,472,513; capital invested, $3,489,250; persons employed, 3,423. The lead product of 1873 was 27,676,320, valued at $1,902,747. The lead industry of St. Louis amounts to nearly $5,000,000. The iron ore mined in the state in 1872 was 509,200 tons; pig-iron produced in the same year, 87,176 tons; zinc ores raised, 11,582,440 lbs. The wine products of the state are believed to have been nearly or quite quadrupled in the last few years.

The number of miles of railroad within the state in 1875 was 3,521; the main lines being the St. Louis, Kansas City and Northern, the Pacific of Missouri, and branches, the St. Louis and Iron Mountain, and branches, the Atlantic and Pacific, the Kansas City, St. Joseph and Council Bluffs, the Hannibal and St. Joseph, the Missouri, Kansas and Texas. The cost of roads and equipments was $141,791,312. The railroad assessment of the state for taxes in 1879 amounted to $23,270,096. The total earnings of the roads in 1878 amounted to $22,415,500. There is a total of about 1000 m. of steel-rail track in the state.

The bonded debt of the state in 1877 was $17,248,000. The amount of property in the state subject to taxation was $614,716,333, of which about $30,000,000 was railroad property.

The commerce of Missouri is extensive. Under the act allowing foreign merchandise to be taken in bond direct to interior ports, a large trade has sprung up in St. Louis, amounting in 1873 to $1,167,690. St. Joseph and Kansas City are also ports of delivery, belonging to the department of Louisiana. A great portion of the produce not only of this state, but of other portions of the northwest, passes through St. Louis on its way to market, making that city the center of a vast domestic trade.

In 1875 there were in the state 35 national banks, with a capital of $9,195,300, and a circulation of $5,908,379. There were at the same time 45 state banks, with a capital of $9,300,000, and 56 savings banks, with capital and deposits amounting to $9,118,306; also 92 private banking-houses. The number of fire and marine insurance companies in 1874 was 35, of which 18 were mutual. The number of life insurance companies was 5, of which 2 were mutual; the 3 joint-stock companies had an aggregate capital of $616,300, and the assets of all the companies amounted to $12,589,884.

The school system of Missouri ranks among the best. In St. Louis, and some of the other cities, the schools are carefully managed, and of an excellent character. The report of the state superintendent for Jan. 1, 1875, gives the following statistics: Number of school districts, 7,483; school-houses, 7,224, valued (aside from those of St. Louis) at $4,188,337; school property in the whole state, $6,774,506; number of schools, 7,461 primary, 86 high, and 282 colored—total, 7,829; number of teachers, males, 6,281; females, 3,395—total, 9,676; average monthly wages of male teachers, $39.87; of female teachers, $30.36. The school funds of the state amount to $3,037,440. The district school-tax in 1874 produced the sum of $1,514,387. The whole amount expended for school purposes in the state in that year, outside of St. Louis, was $2,189,860. The number of persons of school age in the state (5 to 21) was 708,354, of whom 38,447 were colored. There were three normal schools for white teachers, one at Kirksville in the n. part of the state, one at Warrensburg, in the s., and one at Cape Girardeau, in the s.e. Colored teachers are trained at the Lincoln institute. The institutions for higher education are the university of Missouri at Columbia, with collegiate, normal, agricultural, and mechanical, mining and metallurgical, legal, medical, and chemical departments; Washington university (non-sectarian) at St. Louis, with an endowment of $200,000, and buildings and grounds valued at $500,000; college of Christian brothers, at St. Louis, Roman Catholic; St. Louis university, Roman Catholic; McGee college, at College Mound, Cumberland, Presbyterian; Christian university at Canton, under the patronage of the Disciples; Central college at Fayette, Southern Methodist; Hannibal college at Hannibal; Drury college at Springfield, Congregational; St. Joseph's college at St. Joseph, Roman Catholic; St. Paul's college at Palmyra, Protestant Episcopal; St. Vincent's college at Cape Girardeau, Roman Catholic; Lewis college, Glasgow, Methodist; William Jewell college at Liberty, Baptist; Woodland college at Independence, Disciples; Westminster college at Fulton, Presbyterian. There are 4 theological schools, belonging respectively to the Lutherans, Roman Catholics, Presbyterians, and Baptists, 2 schools of law; 5 of medicine, 1 one of which is homeopathic; 1 school of pharmacy, and 1 of dentistry. There are numerous academies, seminaries for girls, and other private schools of a high character, most of them under the control of some religious sect.

The public institutions for special classes are the asylum for the deaf and dumb at Fulton; the school for the blind at St. Louis; the state lunatic asylum at Fulton; the state penitentiary at Jefferson City; 18 orphan asylums, 8 of them under Roman Catholic control; an industrial school for girls, and a home for the friendless, at St. Louis.

The libraries of the state in 1870 numbered 5,645, and contained in all 1,065,638 volumes; 1,742 of these libraries, containing 498,996 volumes, were public; and 3,903, containing 566,642 volumes, were private.

The number of newspapers and periodicals in 1870 was 279, of which 21 were dailies, 3 tri-weeklies, 225 weeklies, 8 semi-monthlies, 23 monthlies, and 1 quarterly. In 1872 the whole number had increased to 289.

The number of church organizations in 1874 was 4,537; of church edifices, 3,369; value of church property, $13,002,900; number of church members, 264,673. The chief denominations, in numerical order, are: Methodists, Baptists, Disciples, Presbyterians, Roman Catholics, Cumberland Presbyterians, United Brethren in Christ, Lutherans, Episcopalians, Congregationalists, Freewill Baptists, German Reformed, Unitarians, Evangelical association, Jews, Swedenborgians, Friends.

The capital of the state is Jefferson City. The principal city, St. Louis, is the largest in the Mississippi valley. The next largest cities and towns in the state are Kansas City, St. Joseph, Hannibal, St. Charles, Springfield, Sedalia, and Lexington.

The constitution now in force was adopted in 1875. The governor and other state officers are elected for a term of 4 years. The state election occurs biennially on the Tuesday next following the first Monday in November. The legislature, composed of a senate and house of representatives, meets biennially on the first Wednesday after the first day of January. The supreme court consists of 5 judges, elected by the people for a term of 10 years, the oldest in commission being chief-justice. The legislature divides the state into such a number of circuits as it may judge the public convenience requires, and the circuit court is composed of one judge for each of such circuits, elected by the people of said circuit for a term of 12 years. The judges of the county courts are elected by the several counties, as are also the judges of probate. The compensation of the governor, state officers, members of the legislature, and of the judges of the courts, is fixed by the legislature. Special courts are provided for the city of St. Louis.

The electoral votes of Missouri for president and vice-president of the United States have been cast as follows: 1824, 3 for Clay and Jackson; 1828, 3 for Jackson and Calhoun; 1832, 4 for Jackson and Van Buren; 1836, 4 for Van Buren and Johnson; 1840, 4 for Van Buren and Johnson; 1844, 7 for Polk and Dallas; 1848, 7 for Cass and Butler; 1852, 9 for Pierce and King; 1856, 9 for Buchanan and Breckenridge; 1860, 9 for Douglas and H. V. Johnson; 1864, 11 for Lincoln and Andrew Johnson; 1868, 11 for Grant and Colfax; 1872, 6 for T. A. Hendricks, 8 for B. Gratz Brown, and 1 for David Davis, for president; and 6 for B. Gratz Brown, 5 for G. W. Julian, 3 for J. M. Palmer, and 1 for W. S. Groesbeck, for vice-president; 1876, 15 for Tilden and Hendricks; 1880, 15 for Hancock and English.

MISSOU'RIA INDIANS, or MISSOURIS, a tribe thus named by the Illinois Indians, but whose designation for themselves was Nudarcha. They were inhabitants of the region of the lower Missouri, and allies of the Illinois, and afterwards of the French. In 1725 some of the chiefs of this tribe went to France with the French commander De Bourgmont, and a sergeant in the command of the latter married a girl of the tribe. Yet this did not prevent the Missourias from assaulting their allies, and the French—a fort on an island in the river—was attacked by them, and the entire force massacred. The French and Missourias afterwards resumed their friendly relations, but the tribe never willingly accepted the English. They became greatly reduced, however, by small-pox and otherwise, and in 1805, when Lewis and Clarke were in their country, they numbered only about 300 souls. They abandoned their old camping-ground and dwelt with the Ottoes, and both these tribes were eventually removed to the Big Blue. Their number, which was 708 in 1862, had been reduced, ten years later, to 464.

MISSOURI COMPROMISE, the proviso contained in the bill admitting Missouri into the union, Feb. 28, 1821. Up to the time when the bill for the admission of Missouri was brought before congress in the session of 1818–19, an equal number of slave-holding and non-slave-holding states had been admitted. Vermont, Ohio, Indiana, and Illinois had balanced Kentucky, Tennessee, Louisiana, and Mississippi. After Alabama was allowed to become a state, without prohibiting slavery, and the bill for the admission of the territory of Missouri was introduced, Tallmadge, member of congress from New York, moved an amendment, which was passed by a vote of 87 to 76, prohibiting the further importation of slaves, and emancipating slave children when they should reach the age of 25. A few days afterwards Taylor of New York, by way of compromise, proposed to amend the bill setting off Arkansas into a territory, by a proviso that slavery should not be extended to any part of the territory ceded by France to this country n. of 36° 30′ lat. His amendment met with bitter opposition from both northern and southern members, and was withdrawn. The opponents of slavery claimed that the question had been settled by the ordinance of 1787, which, in creating a government for the Northwest territory, provided that "there shall be neither slavery nor involuntary servitude in said territory otherwise than in punishment for crime." They maintained that the United States did not recognize slave property, whatever might be the laws of certain states; and they urged the authority of Jefferson, who had introduced a bill, in 1784, prohibiting slavery in the territory of the United States, and in such territory as might thereafter be annexed. The slave-holding members, on the other hand, maintained that congress had no constitutional right to prohibit slavery in the territories, and that such a prohibition would violate the provision guaranteeing to the citizen the enjoyment of his property. They declared that the south would go out of the union rather than submit to the proposed restriction The senate disagreed with the house, and the bill failed to pass. Alabama was admitted in the session of 1819–20, and her admission was followed by that of Maine. Meantime a strong public feeling against slavery had been growing in the middle states and in New England. In 1820 the Pennsylvania legislature resolved that congress had the right to prohibit slavery in the territories; and the legislatures of the other middle states, of Ohio and Indiana, passed resolutions to the same effect. The legislatures of the slave-holding states, on the other hand, opposed any congressional restrictions upon slavery. When congress met, after a long debate the senate, largely through the efforts of Henry Clay, returned the Missouri bill to the house with the clause prohibiting slavery in that state stricken out, but with a new proviso that slavery should not thereafter be allowed n. of 36° 30′. The house struck out the restricting clause by a vote of 90 to 87, and passed the compromise proviso by 134 to 42. The result was to postpone for a time the settlement of the slavery question. The compromise was virtually destroyed by the Kansas and Nebraska bills of 1854.

MISSOURI RIVER (Mud river), a river of the United States, and chief affluent of the Mississippi, rises in two forks, the Jefferson and Gallatin, in the Rocky mountains, Dakota territory, lat. 45° n., long. about 112° west. Its course is first northerly for 500 m., then easterly 1200, then south-easterly to the mouth of the Kansas, and easterly to its junction with the Mississippi. Its length from its source to the Mississippi is 3,096 m.; to the gulf of Mexico, 4,506. It is navigable at high water to the Great falls, 2,540 m. from the Mississippi. It is a turbid, rapid stream, with a vast number of tributaries, the chief of which are the Osage, the Kansas, the Platte, the Cheyenne, the Yellowstone. The upper Missouri is remarkable for its scenery; at 411 m. from its source it enters the gates of the Rocky mountains, a gorge of 5¾ m., between perpendicular walls 1200 ft. high and 450 ft. apart. At the Great falls, 145 m. below, the river falls 357 ft. in a series of rapids and cascades, 16¼ m. long. The largest fall is 87 ft., and the scenery is full of grandeur.

MISSOURI RIVER (*ante*), drains an estimated territory of 500,000 sq. miles. It joins the Mississippi at lat. 38° 50′ 50″ n., and long. 90° 13′ 45″ w. from Greenwich. From the point where the Kansas enters it, its course is nearly e., and within the state of Missouri. Its current, in this part of its course, is about 5 m. an hour. The frequency of snags makes navigation difficult. The banks are thickly covered with wood. Between fort Leavenworth and its mouth three considerable rivers discharge into it—the Kansas, Grand, and Osage, all of which are navigable for 150 to 200 miles. From the Kansas to 40° 38′ n. lat. it is the boundary between Missouri and the Indian territory; and thence to the Big Sioux, between the Indian territory and Iowa. The Platte discharges into the Missouri through three channels, its waters having made a delta at its mouth. Before the Platte, at least five smaller streams—the Big and Little Nemaha, the Nodaway, the Nishnabotana, and the little Tarkio—empty into the Missouri. The course of the river, from the mouth of the Platte to the Kansas, and from fort Pierre to the Big Sioux, is s.e. Its general direction for the first 500 m. is n.; then it flows e.n.e. till it joins the White Earth, from whose mouth its general course is s.e. At a distance of 2,575 m. from its mouth occur the Great falls, where it descends 357 ft. in 16¼ miles. The highest of these falls is 87 ft., and between and below them is a series of rapids. At a distance of 1216 m. from its mouth it is joined by the Yellowstone, its largest tributary; at 1310 m. from its mouth, by the Cheyenne; at 1130 m. from its mouth, by the White; at 853 m., by the Big Sioux; at 600 m., by the Platte; at 340 m., by the Kansas; at 240 m., by the Grand; and at 133 m., by the Osage. It is subject to two annual floods, one caused by the melting of the snow on the alluvial prairies, and occurring in May; the other, occurring in June, is caused by the melting of the mountain snows.

MISSOURI, UNIVERSITY OF, at Columbia, near the center of the state, was organized in 1840. It has received the avails of Missouri's portion of the national grant of land made by congress in 1862 for the establishment of colleges of agriculture and the mechanic arts, and upon this foundation it was reorganized in 1866. It embraces seven departments:—1. The college proper, founded in 1840; 2. the normal school, opened in 1868; 3. the agricultural and mechanical college; 4. the school of mines and metallurgy at Rolla, established in 1871; 5. the college of law, organized in 1872; 6. the college of medicine, organized in 1873; 7. the department of analytic and applied chemistry. The university is governed by a board of curators, appointed by the governor of the state with the advice and consent of the senate. It is open to students of both sexes. It had, in 1878, 20 instructors; and, in all the departments, 418 students. Samuel S. Laws, LL.D., president.

MIST. See FOG.

MISTAKE is a ground in law for having a contract reformed, and may be set up in some cases as a defense; but a mere mistake as to the legal effect of a deed or contract is in general not regarded as a ground for redress. When money has been paid by a mistake as to some important fact, it may be recovered back from the party to whom it was so paid by an action for money had and received; but if the mistake was made in a matter of law, it cannot be recovered back.

MISTAKE (*ante*), in law, is defined by Story as some unintentional act, omission, or error, arising from ignorance, surprise, imposition, or misplaced confidence. In courts of equity, as of law, the maxim applies, *Ignorantia facti excusat; ignorantia juris non excusat*—ignorance of the fact, not of the law, excuses. Thus where one word has by clerical mistake been substituted for another, equity will remedy the mistake; but where the parties have knowingly used a certain form of language believing that its legal effect is different from what it is in reality, they have no such remedy. If the parties be ignorant as regards a fact and aware of their ignorance, yet intend to risk the result, or, knowing the facts, intend to compromise both the law and the facts, then courts will not regard the fact that one party profited less by the contract than he had expected. Where an estate was supposed by both vendor and vendee to belong to the vendor under the law of real property, and was sold in that belief, the court, notwithstanding that the mistake seemed to be one of law, ordered the purchase-money to be refunded. A mistake as to the law of a foreign country is considered to be of fact and not of law, as public policy does not make it necessary that a citizen should be acquainted with the laws of other countries than his own. A trifling or immaterial mistake will not be regarded as ground for disturbing a written agreement. Specific performance will not be enforced when it is clear that the defendant through a mistake not resulting from mere carelessness has entered into a contract materially different from what he had intended. The instrument or contract may be ordered to be re-executed, or may be rescinded altogether. Thus where a solicitor, in writing a conveyance, inserted double the sum intended as purchase-money, he was compelled to re-execute the deed. An award of arbitrators based on a mistake of fact will be rescinded by a court; and even when based on a mistake in law, if the questions of law were not especially referred to them. An important exception to the rule that mistake of law does not excuse exists in those cases where the defendant has voluntarily entered into a promise to perform some act, such as paying a note or accepting a bill of exchange, *because* he supposes himself legally bound to do so, the fact being that he is not. That is to say, no mere waiver of a legal defense, ignorantly made, will compromise the rights of the maker. Often an instrument may be so *construed* by the court as to carry out the intentions of the parties, but in such case the construction must be supported by the instrument itself and not by external evidence; thus where there is a deed of certain land, it is allowable to explain what is meant by the description of boundaries or the relative ownership of several vendees; but if it be alleged that one piece of property has been mistakenly described in place of another, the deed cannot be rectified by mere construction of a court of law, but special action must be had in equity. Where there is any element of fraud or surprise involved, or where the case is one connected with trusts, equity will go very far in correcting the results of mistakes.

MIS'TLETOE (Anglo-Sax. *misteltan*, Ger. *mistel;* the *tan* of the Anglo-Saxon name means a tine or prong, a shoot of a tree; *mistel* is of uncertain etymology, but probably the same, in meaning at least, as the Latin *viscus*), a genus (*viscum*) of small parasitical shrubs of the natural order *loranthaceæ*. This order is exogenous, and contains more than 400 known species, mostly tropical and parasites. The leaves are entire, almost nerveless, thick and fleshy, and without stipules. The flowers of many species are showy. The calyx arises from a tube or rim, which sometimes assumes the appearance of a calyx, and is so regarded by many botanists; what others deem the colored calyx being viewed by them as a corolla of four or eight petals or segments. Within this are the stamens, as numerous as its divisions, and opposite to them. The ovary is one-celled, with a solitary ovule; the fruit one-seeded, generally succulent.—The only British species of this order is the COMMON MISTLETOE (*V. album*), a native also of the greater part of Europe, growing on many kinds of trees, particularly on the apple, and others botanically allied to it, as the pear, service, and hawthorn; sometimes, also, on sycamores, limes, poplars, locust-trees, and firs, but very rarely on oaks (contrary to the common belief). It is very plentiful in some parts of the south of England, its evergreen leaves giving a peculiar appearance to the orchards in winter, when the bushes of mistletoe are very conspicuous among the naked branches of the trees; but it is very local. It is not a native of Scotland, though found naturalized in various places. The stems are *dichotomous* (i.e., divide by forking): the leaves are opposite, of a yellowish-green color, obovate-lanceolate, obtuse. The flowers are inconspicuous, and grow in small heads at the ends and in the divisions of the branches, the male and female flowers on separate plants. The berries are about the size of currants, white, translucent, and full of a very viscid juice, which serves to attach the seeds to branches, where they take root when they germinate, the radicle always turning toward the branch, whether on its upper or under side. The mistletoe derives its nourishment from the living tissue of the tree on which it grows, and from which it seems to spring as if it were one of its own branches. The berries are a favorite food of thrushes. Bird-lime is made from them and from the bark. The mistletoe was intimately connected with many of the superstitions of the ancient Germans and of the British Druids. In the northern mythology, Balder is said to have been slain with a spear of mistletoe. Among the Celts the mistletoe which grew on the oak was in peculiar esteem for magical virtues. Traces of the ancient regard for the mistletoe still remain in some old English and German customs, as kissing under the mistletoe at Christmas. The mistletoe was at one time in high repute as a remedy for epilepsy and convulsions, but it seems to possess no decided medicinal properties.—*Loranthus Europœus*, a shrub very similar to the mistletoe, but with flowers in racemes, is plentiful in some parts of the south of Europe, and very frequently grows on oaks.—*L. odoratus*, a Nepaulese species, has very fragrant flowers.

MISTRAL, Mistraou, or Maestral, the Provençal designation of the *caurus* or *corus* of the Romans, is a n.w. wind which at certain seasons of the year prevails on the s. coast of France. Its approach is heralded by a sudden change of the temperature from the most genial warmth to piercing cold; the air is felt to be purer and more easily inhaled, the azure of the sky is undimmed by cloud, and the stars shine by night with extraordinary and sparkling brightness; this last appearance is an infallible prognostic. The mistral then comes in sudden gusts, struggling with the local aërial currents, but its fast-increasing violence soon overcomes all opposition. In a few hours it has dried up the soil, dispersed the vapors of the atmosphere, and raised a dangerous tumult among the waters of the Mediterranean. The mistral blows with its greatest force from the end of autumn to the beginning of spring, and causes much damage to the fruit-trees in blossom, and often to the field-crops. It is a terror to the mariners of the gulfs of Lyons and Valence, and even the most hardy seaman makes all haste to a harbor of refuge. The most probable cause of the mistral is the derangement of atmospheric equilibrium produced by the cold condensed air of the Alps and Cevennes rushing in to supply the vacuum produced by the expansion of the air in the warm southern provinces of France and on the surface of the Mediterranean. This wind is very appropriately denominated by the Italians *maestro*.

MISTRAL, **Frédéric**, b. in Provence, near Saint-Remy, 1830; son of a rich farmer; educated at the colleges of Avignon and Montpellier, and student of law, but not thereafter practicing it. His fame rests on his devotion to the revival of Provençal literature, especially poetry. Co-laborer in 1852 on the journal *Li Prouvençalo*, he became known at once both as critic and poet. His poems are *La Belle d'Août; La folle Avoine; l'Ode au Mistral; Amertume; La Course de Taurreau; Mireille;* and *Calendin*.

MISTRET'TA, a t. of the island of Sicily, 67 m. w.s.w. of Messina, capital of a district. Pop. '71, 11,218. It occupies a healthy situation near the northern coast in the vicinity of the river Nebroden.

MITÂKSHARÂ is the name of several commentatorial works in Sanskrit, for instance, of a commentary on the text-book of the Vedânta philosophy, of a commentary on the Mîmânsâ work of Kumârila, of a commentary on the Br'ihadâran'yaka (see Veda), etc. The most renowned work, however, bearing this title is a detailed commentary by Vijnânes'wara (also called Vijnânanâtha), on the law-book of Yâjnavalkya (q.v.); and its authority and influence are so great that "it is received in all the schools of Hindu law from Benares to the southern extremity of the peninsula of India as the chief groundwork of the doctrines which they follow, and as an authority from which they rarely dissent" (cf. two treatises on the Hindu law of inheritance, translated by H. T. Colebrooke, Calcutta, 1810). Most of the other renowned law-books of recent date, such as the Smr'iti-Chandrikâ, which prevails in the s. of India, the Chintâman'i, Vîramitrodaya, and Mayûkha, which are authoritative severally in Mithilâ, Benares, and with the Mahrattas, generally defer to the decisions of the Mitâksharâ: the Dâyabhâga of Jîmûtavâhana alone, which is adopted by the Bengal school, differs on almost every disputed point from the Mitâksharâ, and does not acknowledge its authority. The Mitâksharâ, following the arrangement of its text-work, the code of Yâjnavalkya, treats in its first part of duties in general; in its second, of private and administrative law; in its third, of purification, penance, devotion, and so forth; but, since it frequently quotes other legislators, expounding their texts, and contrasting them with those of Yâjnavalkya, it is not merely a commentary, but supplies the place of a regular digest. The text of the Mitâksharâ has been edited several times in India. An excellent translation of its chapter "On Inheritance" was published by Colebrooke in the work above referred to; and its explanation of Yâjnavalkya is followed by the same celebrated scholar in his *Digest of Hindu Law* (3 vols. Calcutta and London, 1801), when translating passages from this ancient author.

MITAU. See MITTAU, *ante.*

MITCHEL, JOHN, 1815–75; b. Ireland; son of a Unitarian minister; graduated in 1836 at Trinity college, Dublin; and having been admitted to the bar, practiced for several years, when he removed to Dublin and became editor of the *Nation.* He now began to display a rebellious spirit, and wrote articles of a revolutionary tendency, thus falling under the suspicion and displeasure of the government. He was at this time in partnership with Gavin Duffy, but quarreled with him, and about 1847 originated the publication entitled *The United Irishman,* which was suppressed after a brief existence, and Mitchel was sent to Australia under sentence for 14 years. He escaped from the penal colony Jan. 3, 1852, and succeeded in getting transportation to New York, where he founded a weekly newspaper called the *Citizen.* He suffered from the climate, and afterwards took up his residence in Tennessee, publishing there a paper called the *Southern Citizen,* which became notorious from its open advocacy of the re-establishment of the slave trade. During the rebellion he was in Richmond, Va., where he edited the *Examiner* newspaper. He returned to New York at the close of the war; made a visit to Ireland; and, in 1875, after he had again settled in New York, was returned to parliament from Tipperary, but being disqualified, did not take his seat. He once more went to Ireland, however, where he died. He published several works upon Irish subjects.

MITCHEL, ORMSBY MCKNIGHT, LL.D., 1810–62; b. Ky.; received an excellent education when very young, being a good Greek and Latin scholar and mathematician when only 12 years of age. He entered West Point as a cadet in 1825, and after graduating in 1829, acted as assistant professor of mathematics in the military academy during the succeeding two years. He practiced law in Cincinnati from 1832 to 1834; and for the next ten years was professor of mathematics, philosophy, and astronomy in the Cincinnati college. In 1836 and '37 he was chief engineer of the Little Miami railroad. He interested himself greatly in astronomy, and took an important part in procuring the erection of an observatory in Cincinnati, of which, when completed, he became the director, combining with this position, in 1859, the directorship of the Dudley observatory in Albany. On the outbreak of the rebellion he entered the military service, being commissioned a brig.gen. of volunteers in Aug., 1861, and ordered to take command of the department of Ohio. He received his promotion to a major-generalship on account of a brilliant movement in April, 1862. He made a forced march into Alabama, and after a sharp engagement near Bridgeport, captured the railroad between Corinth and Chattanooga. In September he was ordered to the command of the department of the south, but before he had time to commence active operations, was attacked by yellow fever, and died. Gen. Mitchel had obtained a high reputation as an astronomer, and was remarkably successful as a mechanician in the construction of astronomical apparatus and instruments of precision. He made several important astronomical discoveries, including, with exactness, that of the period of rotation of the planet Mars. He wrote *The Planetary and Stellar Worlds,* and a *Popular Astronomy;* and, as early as 1846, published an astronomical periodical entitled *The Sidereal Messenger.*

MITCHELL, a co. in s.w. Georgia, having the Flint river on the w. and n.w.; 500 sq.m.; pop. '80, 9,392. It is intersected by a division of the Atlantic and Gulf railroad. The soil is generally fertile and the surface level. Productions are Indian corn, oats, sweet-potatoes, butter, cotton, and sorghum molasses. Co. seat, Camilla.

MITCHELL, a co. in n.e. Iowa, bounded on the n. by Minnesota; 431 sq.m.; pop. '80. 14,361. It is crossed by the Burlington, Cedar Rapids and Minnesota railroad. The soil is fertile, producing liberally of wheat, Indian corn, oats, barley, potatoes, and hay. There are manufactories of carriages and wagons, and agricultural implements; and woolen, saw, and flour mills. Co. seat, Mitchell.

MITCHELL, a co. in n. central Kansas, watered by the Solomon river; 720 sq.m.; pop. '80, 14,913. The surface comprises prairie land, very fertile; principal product, Indian corn. Co. seat, Beloit.

MITCHELL, a co. of n.w. North Carolina, bounded on the w. and n.w. by the Unaka mountains, which separate it from Tennessee, and on the s.w. by Nolichucky river; 530 sq.m.; pop. '80, 9,435. This county is important for its rich mines of mica, the working of which forms a most valuable industry. Iron and asbestus are also found; and forests of various kinds of timber cover the mountains. The productions are Indian corn, wheat, rye, potatoes, wool, and butter. Co. seat, Bakersville.

MITCHELL, DONALD GRANT, b. Conn., 1814; educated at Yale, and called to the bar. He made a European tour, and published the fruits of his observations in 1847, under the title of *Fresh Gleanings; or, a New Sheaf from the Old Fields of Continental Europe.* This work appeared with the pseudonym of "Ik Marvel;" which the author has since retained. He visited Europe during the revolutionary movement of 1848, which suggested his next book, *The Battle Summer,* which came out in 1849. The next year he published anonymously, *The Lorgnette,* a mild social satire. In the same year appeared his *Reveries of a Bachelor,* his most successful book, and which has been translated into French. In 1851 he published *Dream-Life, a Fable of the Seasons.* In 1853 he was appointed U. S. consul at Venice, whence he returned in 1855, and has since lived on a farm at Edgewood, near New Haven. This farm he has made the subject of two of his books, *My Farm of Edgewood*, 1863, and *Wet Days at Edgewood*, 1864. His later publications are *Seven Stories*, 1865; *Doctor Johns*, a novel, which was originally published in the *Atlantic Monthly;* and *Rural Studies*, 1867. His style is modeled upon that of Washington Irving, and though sufficiently graceful, is sometimes felt to lack relief.

MITCHELL, ELISHA, D.D., 1793–1857; b. Conn.; graduated at Yale college in 1813; was tutor there 1816–18; professor of mathematics in the university of North Carolina in 1817–25, and afterwards of chemistry; was ordained a minister in the Presbyterian church in 1821. He was for some time state surveyor. In 1835 he ascended the Black mountains of North Carolina, and ascertained that they were the highest in the United States east of the Rocky mountains, estimating the principal peak, Clingman's peak, to be 6,476 ft. above the sea. In 1844 he again made the ascent, and made the height 6,672 ft. This being disputed, he made a third ascent in 1857 of one of the heights, and was killed by a fall from a precipice. He was buried on its summit. This is called in North Carolina Mt. Mitchell, or Mitchell's high peak.

MITCHELL, JOHN, b. England; a physician who settled at Urbana, Va., about 1700, and gained recognition as a botanist, and after whom the *Mitchelli repens* was named by Linnæus. In 1755 he prepared a map of the British and French dominions in North America; and he also wrote, among other papers that attracted general attention, *The Contest in America between Great Britain and France*, and an essay on *The Causes of the Different Colors of People in Different Climates.* After his death in London in 1793, a manuscript written by him on the yellow fever in Virginia in 1742, came into the possession of Benjamin Franklin, and was found of much service by Dr. Rush of Philadelphia in his experiments in the epidemic of 1793.

MITCHELL, JOHN I., b. Penn., 1837; was educated at the university at Lewisburg, in Union co., Penn.; and, graduating in 1858, read law and was admitted to the bar. At the outbreak of the rebellion, he enlisted in the 136th Pennsylvania volunteers, and was promoted to the rank of capt. After the close of the war, he settled at Wellsboro, Tioga co., Penn., and practiced law. In 1868 he was elected district-attorney of the county, and having served his term, was, in 1871, elected a member of the Pennsylvania house of representatives. He was chairman of the judiciary committee, served continuously until 1876, and became the recognized leader of the republican party in the house. In 1876 he was elected a member of congress, and was re-elected in 1878, but declined a renomination in 1880. In Feb., 1881, he was elected a member of the U. S. senate for Pennsylvania, after a bitter and protracted contest, in which a number of the most prominent men in the state were candidates.

MITCHELL, JOHN KEARSLEY, 1796–1858; b. Va.; educated at the university of Pennsylvania, and, after making three voyages to China as surgeon of a ship, began to practice medicine in Philadelphia. In 1824 he lectured on medicine and physiology at the Philadelphia institute, where he became professor of chemistry in 1826. He accepted the chair of the theory and practice of medicine at the Jefferson medical college in 1841. Besides many contributions to scientific periodicals he published: *Saint Helena, a Poem by a Yankee*, 1821; *Indecision and other Poems*, 1839; *On the Cryptogamous Origin of Malarious and Epidemic Fevers*, 1849; and a collection of his essays appeared in 1858.

MITCHELL, MARIA, b. Mass., 1818; of Quaker parents. Her father, a school-teacher in Nantucket, gave much attention to astronomy, in which his daughter at an early age became greatly interested. She devoted study especially to nebulæ and comets; and in 1847 she published an account of the discovery of a new telescopic comet, for which she received from the king of Denmark a gold medal. During the next ten years she was employed by the coast survey, and assisted in compiling the nautical almanac. In 1857 she traveled in Europe, visiting the principal observatories and astronomers; and in 1865 she became professor of astronomy in Vassar college. Miss Mitchell is a member of the American association for the advancement of science, and also of the American academy of arts and sciences, of which she was the first female member admitted. A short biography of her may be found in *Woman's Record of Distinguished Women*, by Mrs. Sarah J. Hale.

MITCHELL, NAHUM, 1769–1853; b. Mass.; a descendant of Experience Mitchell, one of the founders of the first New England settlement; graduated at Harvard, class of 1789; was a teacher in early youth, and having studied law was admitted to the bar in 1792, and commenced practice in his native town, East Bridgewater. In 1811 he was appointed justice of the circuit court of common pleas for the s. circuit, and in 1819 chief-justice, holding the office for two years. He was highly esteemed in the community, and by members of the profession in his native state and in Maine, and was placed in many responsible positions. In 1798, and for several consecutive sessions, he was elected representative to the general court; member of congress 1803–5, state senator 1813–14, and member of the executive council 1814–20. In 1839 he was again elected to the general court, this time from Boston, to which city he had removed. In 1827 he was chairman of the railroad commission which surveyed the route of the Boston and Albany railroad. He was at one time librarian and treasurer of the Massachusetts historical society, and was for some years president of the Bible society of Plymouth county. Endowed with musical talent of a high order and a passion for the art, associated with Mr. Bartholomew Brown he published *The Bridgewater Collection of Sacred Music*, for many years the standard musical publication of New England, the sale reaching 100,000 copies. In 1840 he published *History of the Early Settlement of Bridgewater*, with genealogical tables, the first American publication of the kind.

MITCHELL, PETER, Hon., b. New Brunswick, 1824; educated in his native place of Newcastle, served his county two terms (5 years) in the provincial parliament, entering public life in 1856, and was appointed life-member of the legislative council. He became a member of the executive government of New Brunswick in 1858 in the discontented political condition of the British American provinces in relation to the relative political influence of Upper and Lower Canada, and in 1864 suffered defeat with his government, which favored by a large majority a federal union of the whole of British America from the Atlantic to the Pacific, including Prince Edward's Island and Newfoundland, which latter, however, refused to co-operate. He was appointed delegate to Canada and England on this subject and that of the Intercolonial railway from Halifax to Quebec. In 1865, associated with the hon. R. D. Wilmot, mayor of St. John's, he formed an administration in order to test the opinion of the province on the question of confederation, and was president of the executive committee. When the vote was taken, confederation was carried 33 to 8. He was an ardent promoter of British union, and rendered essential service by his writings and public speeches. In July, 1867, he was given the position of minister of marine and fisheries in the cabinet of the Dominion government.

MITCHELL, S. WEIR, M.D., b. Philadelphia, 1829; educated at Jefferson medical college. He has since practiced in Philadelphia, making a specialty of nervous diseases. Among his writings are: *Injuries of the Nerves; Nurse and Patient; Fat and Blood;* and two volumes of magazine stories.

MITCHELL, SAMUEL AUGUSTUS, 1792–1868; b. Conn.; a writer on geographical subjects; passed his childhood in Connecticut, and removed to Philadelphia, where he labored 40 years in cosmographical research. He prepared text-books of geography for the use of schools, maps and treatises considered superior to all others of their date. In 1846 he published *General View of the World;* in 1851, *Universal Atlas*, 76 sheets, forming a series of 130 maps, plans, and sections; in 1852, *Pocket Maps*, 53 in number;—in all 24 works, 400,000 copies of which have been sold in one year.

MITCHELL, Sir THOMAS LIVINGSTONE, D.C.L., 1792–1855; b. Scotland; son of John Mitchell. His family altered its name of Mitchell upon its intermarriage with the Livingstones. Thomas Mitchell began his service in the British army in the Portugal campaign of 1808, and at the close of the peninsular war had been promoted maj. He was then sent to make surveys and plans of the peninsular battle-fields. In 1827 he published *Outlines of a System of Surveying for Geographical and Military Purposes*, and was made deputy surveyor-general of New South Wales. Besides the routine work of this office, he led a number of exploring expeditions into the interior of Australia. In 1831–32 he discovered the Pell river and the Nammoy. In 1835 he traced the course of the river Darling, which he followed, in 1836, as far as the Murray river, with which it unites. In the same expedition he followed the Glenelg river to the ocean. He gave the world the results of his explorations in his *Three Expeditions into the Interior of Eastern Australia, etc.*, which appeared in 1838. He came to England to take charge of this work and of his *Map of the Colony of New South Wales* in their passage through the press, and on the occasion of this visit was knighted. He also received the degree of D.C.L. from Oxford, and was elected to the royal and the geographical societies. On his return to Australia he conducted a fourth exploring expedition, in which he reached 21° 30′ south. He followed the Victoria river, which he was the first to find and name, but failed to advance as far as the gulf of Carpentaria, on account of losing his horses from a continued drought. In 1850 he published a school geography for use in New South Wales under the name of *Australian Geography.* His next publication was an account of a new steam propeller which he had invented on the principle of the boomerang. This work was published as the *The Origin, History, and Description of the Boomerang Propeller*. In 1854 he was made a col.

MITCHELL'S PEAK. See BLACK MOUNTAINS, *ante.*

MITCHILL, SAMUEL LATHAM, LL.D., 1764–1831; b. Long Island, N. Y.; graduated doctor of medicine in 1786 in the university of Edinburgh; returned to America in 1787, and studied law for three years; was appointed in 1792 professor of chemistry, natural history, and philosophy in Columbia college. He had at this time a controversy with Dr. Priestley in reference to some of Lavoisier's principles. In 1796 he made a geological and mineralogical tour along the Hudson. In connection with Dr. Edward Miller and Elisha H. Smith he established the quarterly *Medical Repository*, of which he was for 16 years the editor. He was a member of the legislature in 1801; twice a representative in congress, in 1801–4 and 1810–13; and in 1804 U. S. senator. In 1808 he became professor of natural history in the college of physicians and surgeons, and in 1820 of botany and materia medica. He was vice-president of Rutgers medical school in 1826–30. He was somewhat eccentric. He proposed to have the name of this country changed to Fredonia, and in 1804 wrote *An Address to the Fredes or People of the United States.* He published the following works: *Observations on the Absorbent Tubes of Animal Bodies; Nomenclature of the New Chemistry; Life, Exploits, and Precepts of Tammany, the famous Indian Chief; Synopsis of Chemical Nomenclature and Arrangement.*

MITE, a name sometimes given to the *acarides* generally (see ACARUS); sometimes only to those of them which have the feet formed for walking, and the mouth not furnished with a sucker formed of lancet-like plates, as in the ticks (q.v.), but with mandibles. All of them are small creatures; the species are very numerous; they feed chiefly on decaying animal and vegetable substances, or are parasitical on quadrupeds, birds, and insects. The CHEESE MITE (*acarus domesticus*) is one of the best-known species; another is the FLOUR MITE (*A. farinæ*), too common among flour, in both of which the body is covered with hairs very large in proportion to its size, and capable of a considerable amount of motion. The SUGAR MITE (*A. saccharinus*) swarms in almost all *soft* sugar; but refined and crystallized sugar seems to defy its mandibles, and is free of it. The surface of jelly and preserves, when it has begun to become dry, is often covered with multitudes of very small mites. A species of mite is the cause of itch (q.v.); and many of the lower animals are infested by parasites of this tribe. Beetles may often be seen absolutely loaded by a species which preys on them; and bird-fanciers regard with the utmost horror the RED MITE, which lurks in crevices of cages and aviaries, and sucks the blood and eats the feathers of their inmates.

MITER, the point or line of union of moldings meeting at an angle.

MITFORD, MARY RUSSELL, a well-known English authoress, was the only child of a physician, and was b. at Alresford, Hants, Dec. 16, 1786. At the age of ten she was sent to a boarding-school at Chelsea, and also placed under the guidance and tuition of a Miss Rowden, a lady of a literary turn, who had already educated lady Caroline Lamb, and was destined to be the instructress of Miss Landon and of Fanny Kemble. During the five years she spent here she read with avidity, studying the tragic authors of France, Shakespeare, and the early dramatists of England. At the age of 15 she returned home, and before she was 20 she published three volumes of poetry. These having been severely castigated by the *Quarterly Review*, she applied herself to writing tales and sketches for the magazines. The profession she had adopted from taste she was obliged to continue from necessity, for the spendthrift habits of her father, a good-natured but careless gentleman, had exhausted a competent fortune, and left him dependent on his daughter. The first volume of *Our Village* appeared in 1824, and the series of five volumes was completed in 1832. Of the more important of her dramatic works, *Julian* was first performed in 1823; the *Foscari* in 1826; and *Rienzi* in 1828—all of them, and especially the last, with success. Among her other important works are *Recollections of a Literary Life* (3 vols. 1852); *Atherton and other Tales* (a novel, 3 vols. 1854); and in 1854 she also published a collected edition of her dramatic works, in two volumes. In 1838 she received a pension from government, but neither this nor the growing ill-health of her later years induced her to relax her literary industry. She died at her residence, Swallowfield cottage, near Reading, Jan. 10, 1855.

Successful both as a compiler and an author, Miss Mitford has produced many interesting volumes; but her fame—if the admiring respect for an amiable lady and a woman of graceful literary genius may be so called—rests chiefly on the sketches of country life which compose *Our Village.* These sketches are chiefly memorable for their style, which, if not witty, is vivacious, genial, and humorous; the outcome at once of a good heart, an active brain, and a fine fancy.

MITFORD, WILLIAM, was b. in London, Feb. 10, 1744, and studied at Queen's college, Oxford, but left the university without taking his degree. In 1761 he succeeded to the family estate; and in 1769 became a capt. in the South Hampshire militia, in which capacity he made the acquaintance of Gibbon, then a maj. of the same, by whose advice and encouragement he was induced to undertake a history of Greece. Mitford's first work, entitled *An Inquiry into the Principles of Harmony in Languages, and of the Mechanism of Verse, Modern and Ancient*, appeared in 1774; but by far his most important publication was his *History of Greece*, the first volume of which appeared in 1784, and the last in 1818. It is a pugnacious, opinionative, one-sided, and even fanatical production. The author is an intense hater of democracy, and can see in Philip of Macedon nothing but a great statesman, and in Demosthenes nothing but an oratorical demagogue. Yet his zeal, which so often led him astray, also urged him, for the very purpose of substantiating his views, to search more minutely and critically than his predecessors into certain portions of Greek history, and the consequence was that Mitford's work held the highest place in the opinion of scholars until the appearance of Thirlwall and Grote. He died Feb. 8, 1827.

MITHRAS (cf. Sanskrit *Mitram*, friend), the highest of the twenty-eight second-class divinities of the ancient Persian pantheon, the *Ized* (Zend. *Yazata*), or genius of the sun, and ruler of the universe. Protector and supporter of man in this life, he watches over his soul in the next, defending it against the impure spirits, and transferring it into the realms of eternal bliss. He is all-seeing and all-hearing, and, armed with a club—his weapon against Ahriman and the evil *Dews*—he unceasingly "runs his course" between heaven and earth. The ancient monuments represent him as a beautiful youth, dressed in Phrygian garb, kneeling upon an ox, into whose neck he plunges a knife; several minor, varying, allegorical emblems of the sun and his course, surrounding the group. At times he is also represented as a lion, or the head of a lion. The most important of his many festivals was his birthday, celebrated on Dec. 25, the day subsequently fixed —against all evidence—as the birthday of Christ. The worship of Mithras early found its way into Rome, and the mysteries of Mithras (*Hierocoracica, Coracica Sacra*), which fell in the spring equinox, were famous even among the many Roman festivals. The ceremonies observed in the initiation to these mysteries—symbolical of the struggle between Ahriman and Ormuzd (the good and the evil)—were of the most extraordinary and, to a certain degree, even dangerous character. Baptism and the partaking of a mystical liquid, consisting of flour and water, to be drunk with the utterance of sacred formulas, were among the inaugurative acts. The seven degrees—according to the number of the planets—were: 1. Soldiers; 2. Lions (in the case of men), or hyenas (in that of women); 3. Ravens; 4. Degree of *Perses;* 5. Of *Oromios;* 6. Of *Helios;* 7. Of fathers—the highest—who were also called eagles and hawks. At first of a merry character—thus the king of Persia was allowed to get drunk only on the feast of the mysteries—the solemnities gradually assumed a severe and rigorous aspect. From Persia the cultus of Mithras and the mysteries were imported into Asia Minor, Syria, Palestine, etc., and it is not unlikely that in some parts human sacrifices were connected with this worship. Through Rome, where this worship, after many vain endeavors, was finally suppressed in 378 A.D., it may be presumed that it found its way into the w. and n. of Europe; and many tokens of its former existence in Germany, for instance, are still to be found, such as the Mithras monuments at Hedernheim, near Frankfort-on-the-Main, and at other places. Among the chief authorities on this subject are Anquetil du Perron, Creuzer, Silvestre de Sacy, Lajard, O. Müller (*Denkmäler d. alten Kunst*). See GUEBRES, PARSEES, ZENDAVESTA.

MITHRIDATES (more properly, MITHRADATES, a name formed from the Persian *Mithras*, or *Mithra*, "the sun," and an Aryan root *da*, to give; hence "sun-given" or "sun-born" prince), the name of several kings of Pontus, Armenia, Commagene, Parthia, and the Bosporus, all of whom have sunk into insignificance, with the exception of Mithridates VI. of Pontus, surnamed EUPATOR and DIONYSUS, but more generally known as MITHRIDATES THE GREAT. Little is known of his early career. He succeeded his father, probably about 120 B.C., while under 13 years of age, and soon after subdued the tribes who bordered on the Euxine, as far as the Chersonesus Taurica (Crimea), and after the death of Parysatis, incorporated the kingdom of the Bosporus with his dominions. The jealous behavior of the Romans, and the promptings of his own ambitious spirit, now incited him to invade Cappadocia and Bithynia, but a wholesome fear of the power of the Great Republic induced him to restore his conquests. The *First Mithridatic War* was commenced by the king of Bithynia (88 B.C.), who, at the instigation of the Romans, invaded Pontus. Mithridates sent an ambassador to Rome to complain of this treatment, but he was sent back with an evasive reply. Mithridates immediately commenced hostilities, and his generals repeatedly defeated the Asiatic levies of the Romans, and he himself took possession of Bithynia, Cappadocia, Phrygia, and the Roman possessions in Asia Minor, the inhabitants of which last hailed him as a deliverer. By his orders, a great massacre of the Romans took place, in which, according to one account, 80,000, and according to another 150,000 were slain. He also sent three powerful armies to aid the Greeks in their rebellion, but the disastrous battles of Chæronea and Orchomenus broke his power in that country. He was, however, driven from Pergamus (85 B.C.) by Flavius Fimbria, and reduced to the necessity of making peace with Sulla, relinquishing all his conquests in Asia, giving up 70 war-galleys to the Romans, and paying 2,000 talents. The wanton aggressions of Murena, the Roman legate, gave rise to the *Second Mithridatic War*, in 83 B.C. Mithridates was wholly successful in this war, but peace was concluded on the *status quo*, 81 B.C. Mithridates felt, however, that this was merely a truce, and lost no time in preparing for a third contest, in alliance with Tigranes, king of Armenia, the next most powerful monarch of Asia. Tigranes seized Cappadocia, 76 B.C., and Mithridates, in the following year, invaded Bithynia, commencing the *Third Mithridatic War*. Mithridates formed an alliance with Sertorius (q.v.), and obtained the services of Roman officers of the Marian party, who trained his army after the Roman manner. The arms of Mithridates were at first successful; but afterward the Roman consul Lucullus (q.v.) compelled him to take refuge with Tigranes, 72 B.C. Lucullus then conquered Pontus, defeated Tigranes, 69 B.C., at Tigranocerta, and both Tigranes and Mithridates at Artaxata, 68 B.C. Mithridates, however, recovered possession of Pontus. After the war had lingered for some time, Cneius Pompeius (see POMPEY) completed the work of Lucullus, 66 B.C., defeating Mithridates on the Euphrates, and compelling him to flee to the Bosporus. Here his indomitable spirit prompted him to form a new scheme of vengeance, which was, however, frustrated by the rebellion of his son, Pharnaces, who besieged him in Panticapæum. Deeming his cause hopeless, Mithridates put an end to his own life, 63 B.C. Mithridates was a specimen of the true eastern despot, but he possessed great ability, and extraordinary energy and perseverance. His want of success was owing not to his defects as a general, but to the impossibility of raising and training an army capable of coping with the Roman legions, and his system of tactics during the third Mithridatic war plainly shows his thorough conviction of this fact. He had received a Greek education at Sinope, could speak no less than 25 different languages and dialects, and possessed considerable love for the arts, of which his magnificent collections of pictures, statues, and engraved gems were a proof. In the estimation of the Romans, he was the most formidable opponent they ever encountered, and occasional reports of his various successes spread the utmost terror among them.

MITLA, a city in s.e. Mexico, on the plain of Mixtecapan, 15 m. s.e. of Oaxaca. The region is inhabited by the Zapoteco race, and is a city of ruins (Aztec, Mictlan, place of the dead). No positive information has been obtained as to the builders, but it is thought that its extensive ruins of monuments and edifices were the work of the progenitors of the present inhabitants. Its ruined palaces and temples, adorned with artistic sculpture, are well preserved, many roofs being supported by columns. In 1860, in a publication entitled *Charnay's Ruines Américaines*, there appeared a collection of photographs of these ruins.

MITRAILLEUSE, a machine-gun in which 37 or more large-bored rifles are combined with breech action, by means of which a shower of bullets may be rapidly projected by one man. It was invented in Belgium, and adopted by the French emperor soon after the Prussian-Austrian war of 1866. It was the chief cannon of the French artillery during the Franco-German war of 1870. The mitrailleuse existed in a primitive form as early as the 14th c., and well-preserved specimens may be found in the arsenals and museums of Vienna, Rome, Berlin, Moscow, and Constantinople.

MITRE (Lat. *mitra*, also *infula*), the head-dress worn in solemn church services by bishops, abbots, and certain other prelates in the western church. The name, as probably the ornament itself, is borrowed from the orientals, although, in its present form, it is not in use in the Greek church, or in any other of the churches of the various eastern rites. The western mitre is a tall, tongue-shaped cap, terminating in a twofold point, which is supposed to symbolize the "cloven tongues," in the form of which the Holy Ghost was imparted to the apostles, and is furnished with two flaps, which fall behind over the shoulders. Opinion is much divided as to the date at which the mitre first came into use. Eusebius, Gregory of Nazianzus, Epiphanius, and others speak of an ornamented head-dress, worn in the church; but there is no very early monument or pictorial representation which exhibits any head-covering at all resembling the modern mitre. From the 9th c., however, it is found in use, although not universally: and instances are recorded in which the popes grant permission to certain bishops to wear the mitre; as, for example, Leo IV. to Anschar, bishop of Hamburg, in the 9th century. The material used in the manufacture of the mitre is very various, often consisting of most costly stuffs, studded with gold and precious stones. The color and material differ according to the festival or the service in which the mitre is used, and there is a special prayer in the consecration service of bishops, used in investing the new bishop with his mitre. The mitre of the pope is of peculiar form, and is called by the name *tiara* (q.v.). Although the mitre properly belongs to bishops only, its use is also permitted by special privilege to certain abbots, to provosts of some distinguished cathedral chapters, and to a few other dignitaries. See Binterim, *Denkwürdigkeiten der Kirche*, 1 B. 2 Th., p. 348.

The mitre, as an ornament, seems to have descended in the earliest times from bishop to bishop. Among the Cottonian MSS. is an order dated July 1, 4 Henry VI., for the delivery to archbishop Chichely of the miter which had been worn by his predecessor. It was in some cases a very costly ornament. Archbishop Pechcham's new mitre, in 1288, cost £173 4s. 1d In England, since the reformation, the mitre is no longer a part of the episcopal costume, but it is placed over the shield of an archbishop or bishop, instead of a crest. The mitre of a bishop has its lower rim surrounded with a fillet of gold; but the archbishops of Canterbury and York are in the practice of encircling theirs with a ducal coronet, a usage of late date and doubtful propriety. The bishop of Durham surrounds his mitre with an earl's coronet, in consequence of being titular count palatine of Durham and earl of Sedburgh. Before the custom was introduced of bishops impaling the insignia of their sees with their family arms, they sometimes differenced their paternal coat by the addition of a mitre. Mitres are rare as a charge in heraldry, but are sometimes borne as a crest, particularly in Germany, to indicate that the bearers were feudatories, or dependencies of ancient abbeys.

MITRE, BARTOLOMÉ, b. Buenos Ayres, 1821; became an instructor in a military college in Bolivia in 1846 and also a journalist; was next engaged as an officer in the Bolivian army in a war against Peru; then successively as editor, politician, and finally military leader again in the movement of Buenos Ayres against gen. Urquiza in 1852, which resulted in the quasi independence of that province from the Argentine confederation. After returning to peaceful pursuits, he wrote the *Historia de Belgrano*. In 1860, after the re-union of the seceded province to the Argentine confederation, he was chosen governor of Buenos Ayres; and in 1862, when new difficulties with the federal government had brought into existence the Argentine republic in place of the confederation, Mitre was elected president for six years. He was also a candidate again in 1874, but was defeated; after which he headed a rebellion that proved disastrous to his fortunes. Since then he has lived in retirement.

MITRE SHELL. A name applied to the shells of several species of *mitra*, a genus of gasteropods belonging to the family *volutidæ* (q.v.). The shells are very beautiful and much prized by collectors, the favorite being the bishop's mitre shell, of the species *M. episcopalis*. In the genus mitra the shell is fusiform, thick, spire elevated, acute; aperture small, notched in front; columella obliquely plaited; operculum very small. The animal has a very long proboscis; and, when irritated, emits a purple liquid having a very offensive smell. The eyes are situated on the tentacles or at their base. Over 400 recent and 100 fossil species have been described. In *M. episcopalis* the animal has a narrow foot, compressed and chaunded at its root, nearly square and slightly articulated in front, with a margined furrow, and pointed behind; eyes sessile at the base of the tentacles. The proboscis is twice the length of the shell. The shell is turreted, smooth, white, spotted with bright red; pillar, four plaited; outer lip denticulated at its lower part; epidermis thin. It is found in East Indian seas and islands of the South sea. *M. adusta* has a fusiform shell, turreted, ornamented with longitudinal reddish-brown spots; striæ transverse, impressed, rather remote and dotted; pillar fine plaited. It is found at Timor, Vanikoro. There are two varieties. The different species are found at depths varying from the surface to 17 fathoms, on reefs, sandy mud, and sands. They are all inhabitants of warm countries.

MITSCHERLICH, EILHARD, a distinguished Prussian chemist, was b. at Neuende, near Jena, in 1794, and d. at Berlin in 1863. In 1811 he proceeded to the university of Heidelberg, where he devoted himself to history, philology, and oriental languages; and he continued the study of these subjects at Paris and Göttingen. It seems to have been at the last-named university that (1814 or 1815) he first turned his attention to geology and mineralogy, chemistry and physics, and it was not till 1818, when he was at Berlin, that he selected chemistry as his special study. His observations on the striking similarity between the crystalline form and the chemical composition of the arseniates and the phosphates led to his discovery of the law of isomorphism (q.v.), the importance of which was so fully recognized by Berzelius that he invited the young chemist, in 1819, to Stockholm, where he studied till 1821, when, on the death of Klaproth, he was, on the strong recommendation of Berzelius, appointed to the vacant chair of chemistry at Berlin. One of his earliest discoveries after his appointment was that of the double crystalline form of sulphur, the first observed case of dimorphism. See DIMORPHOUS. His investigations regarding the formation of artificial minerals, and his memoirs on benzine and on the formation of ether must be classed among his most important contributions to chemistry; but it is mainly on the discovery of isomorphism and dimorphism that his reputation will finally rest. His principal work is his *Lehrbuch der Chemie*, begun in 1829, and concluded in 1841. It has passed through five editions, and is especially valuable for the clear and simple way in which he has brought mathematics and physics to bear upon the subject. He was an honorary member of almost all the great scientific societies, and received the gold medal from the Royal Society of London for his discovery of the law of isomorphism.

MIT'TAU, or MITAU, the chief t. of the government of Courland, in European Russia, is situated on the right bank of the Aa, 25 m. s.w. of Riga, and was founded in 1271, by the grand master of Teutonic Knights. It was annexed to Russia in 1795. Pop. '67, 23,100, the majority of whom are Germans by birth or descent, 1000 are Jews, and only a few Russians. The town is indifferently built, the houses being chiefly of wood and painted of a green or brown color. The most important buildings are the old castle—now the seat of the governor of the province, four churches, an astronomical observatory, a public library, a museum, and a number of educational and charitable institutions. As regards commerce and industry, the town occupies only the third place in the government, its principal product being articles of japanned iron and tin; there is an export trade in hemp, flax, and corn. Mittau is the winter residence of the gentry of the surrounding country, and was for some time the abode of Louis XVIII.

MIT'TERMAIER, KARL JOSEPH ANTON, 1787-1867, b. in Munich, Bavaria; educated at the universities of Landshut and Heidelberg; for two years, 1819-21, he was a professor at Bonn, but the rest of his life was passed as professor of law and jurisprudence at Heidelberg, with the exception of the time occupied as representative of Baden at the provisional Frankfort parliament and occasional pleasure-trips in Italy, which last occasioned his *Italienische Zustände*, a criticism of Italian affairs. In politics Mittermaier was liberal, but would now be considered almost conservative by the radical party. For 20 years, 1820-40, he was a member of the Baden legislature. His greatest claim to distinction, however, lies in his extensive writings on jurisprudence, among which is a complete manual of criminal law, *Lehrbuch des Criminal-prozesses;* and he was an earnest advocate of reform in the German criminal procedure and in prison discipline. The number of his published writings is very large, including many treatises on branches of law, discussions on all the important questions of his time connected with jurisprudence, and especially on trial by jury and the penal code. He also published a translation of Francis Lieber's *Letter on Anglican and Gallican Liberty*, and edited the German translation of the same author's *Civil Liberty*.

MIT'TIMUS, an English law-term for a writ by which a record is transferred out of one court into another.

MITTIMUS (*ante*), in criminal practice both in England and in the United States, is a written mandate issued by a competent judicial officer, enjoining an officer of the law to safely convey the body of a prisoner to some place of imprisonment, and also commanding the keeper of such jail to receive and retain the prisoner for a certain time, or until released in course of law. A mittimus is more commonly called a commitment. The document must be issued in the name of the people or of the magistrate, must be dated, is usually sealed, and must describe with reasonable certainty the name or, if not known, the person of the accused, and the criminal offense with which he is charged. Technical nicety in the language of the mittimus is not necessary. The precept passes to the jailer, who is bound to receive the prisoner, and may be indicted for refusal, in which case the officer is bound to retain custody of the accused. It has been held, where a mittimus had been granted on evidence by a justice of the peace, and it was handed to the accused person with the request that he would carry that note to the jailer, and he, in ignorance of its nature, did so, that his detention was in all respects legal.

MITTOO, a country of central Africa, bounded n. by the territory of the Dinka, s. by that of the Nyamnyam, and lying between the Rohl and Roah rivers. The soil is fertile, producing various cereals, tuberous plants, and leguminous and oily fruits, without much labor. The wearing of iron and copper ornaments is common to both sexes, and both are fond of chains for fastening trinkets to their bodies. A thick iron chain on the neck indicates wealth, and some wear four of them. The people have goats and poultry, but no cattle; they eat the flesh of dogs, and are in contempt called Dyoor, or savages. In war they use bow, arrow, and spear, but not shields.

MITT'WEIDA, a t. of Saxony, in the circle of Zwickau, 35 m. s.e. of Leipsic. For centuries Mittweida has been noted for its industry. The principal branches of industry are spinning, cotton-weaving, manufacture of fustian, etc., together with dye-works and bleach-fields. Pop. '75, 9,093.

MITYLE'NÉ. See LESBOS.

MIXED CADENCE, in music, is a peculiar way of concluding a musical period or passage, which differs from the perfect, imperfect, and plagal cadence. The mixed cadence, which is most frequently used, consists of the sub-dominant harmony followed by that of the dominant.

MIXED MARRIAGES. In various countries of Europe, marriages between persons of different religious belief have either been prohibited or put under restrictions. The canon law forbade marriages between Christians and non-Christians; at one time, it merely discouraged, at another altogether prohibited the marriage of orthodox Christians with heretics. Subsequently to the reformation, papal dispensations were in use to be granted for marriages between Catholics and Protestants, with the condition annexed, that the children should be brought up in the Catholic faith. During the latter part of the 17th c., parents seem to have been left at liberty to make what agreement they pleased on this head; and in default of their making any, it was presumed that the children would follow the religion of their father. In the middle of the 18th c., the validity of mixed marriages, even when celebrated by the civil magistrate, was recognized by the papal court; and under Napoleon's rule, they became common, without stipulations as to the children. The events of 1815 restored sufficient influence to the Roman Catholic church to enable the clergy to put in force a rule by which they could refuse to celebrate such marriages without an assurance that the children would be brought up Catholics. By the law of many of the German states, the clergyman of the bride was the only person who could competently officiate, and an engagement of this kind was often not only repugnant to the father as a Protestant, but illegal. Conflicts followed between the civil and ecclesiastical authorities, which have sometimes been obviated by the priest, on whom the law imposes the celebration of the marriage, not pronouncing the nuptial benediction, but giving his presence as a witness along with two other witnesses when the parties declared themselves husband and wife—a kind of marriage whose validity is perfectly recognized by the canon law. In Spain, marriages between Catholics and Protestants have sometimes taken place in this way, avoiding the stipulations otherwise necessary regarding the children.

There was, till lately, a great diversity in the state of the law of mixed marriages in different parts of Germany. Prussia was the first state to do away the former restrictions by the recognition of a civil ceremony alone as that which constitutes marriage in the eye of the law. Until that change, the letter of the law provided that the children should be brought up in the faith of their father, and no compacts to the contrary were allowed. Practically, however, the law was largely evaded, no one having a recognized interest to object to the fulfillment of such agreements. In Bavaria, mixed marriages might be performed either by Protestant or Catholic clergymen; and the spouses had it in their power to make what arrangements they pleased regarding the children before or after marriage; but if no such arrangements happened to have been made, the children were brought up in the religion of their father. In Saxony, and various other German states, the spouses might, before marriage, make what arrangements they liked as to the religion of their children: but if they had made none, the law obliged them to be brought up in the faith of their father. A bill for rendering civil marriage obligatory throughout the empire was brought before the Reichstag in 1874, and passed in 1875, thus extending the system of Prussia to all other German states. This bill enables men and women to be married independently of the consent of the clergy (not always easily obtained in Catholic districts), or of the difference of their religious beliefs. It also allows of children being left unbaptized, and brought up without being assigned to any religious denomination whatsoever. In Austria, the interposition of the Catholic priest is required in marriages between Catholics and Protestants. He need not, however, give the sacerdotal benediction; his passive assistance only is required, either in taking the declaration of the parties, which is followed by a Protestant ceremony, or by being present as a witness at the Protestant ceremony. When the husband is Catholic, all the children must be brought up Catholics; when the husband is Protestant and the wife Catholic, the sons follow the father and the daughters the mother. In Denmark stipulations may be made before or after marriage, and can be altered by mutual consent of the parents, or, in some cases, even after the death of one of them. Mixed marriages were, till lately, altogether prohibited in some of the Catholic cantons of Switzerland, but they are now authorized in all the cantons by the federal laws. It is generally the clergyman of the husband's creed who officiates, but at Zürich the ceremony is performed in both churches. In most cases, the children are required to be educated in the religion of their father.

In most German states, marriages between Christians and Jews or Mohammedans used to be interdicted; but, after 1849, the prohibitions were in individual cases dispensed with. In Denmark such marriages have been permitted on condition of the children being brought up Protestants. In Russia the members of both Greek and Roman communions are prohibited from intermarrying with non-Christians: members of the orthodox Greek church cannot marry Greek sectaries; but when an orthodox Russian marries a Protestant or Catholic, the benediction must be given in the Greek church, and the children baptized in the Greek communion. When the parents are of different religions, but neither belongs to the Greek church, ante-nuptial stipulations will be given effect to; if none have been made, the sons follow the father's faith, and the daughters the mother's.

In France the law regards marriage as a purely civil contract, and recognizes only the civil celebration, which is completely separated from the religious rite. As the faith of the parents is not taken cognizance of, questions regarding the religious education of the children cannot arise before the civil tribunals.

The only restriction to which mixed marriages are now subjected in any part of the United Kingdom is imposed by act 19 Geo. II. c. 13, applicable to Ireland only, that a marriage celebrated by a Catholic priest between a Roman Catholic and a Protestant, or a person who within 12 months has been or professed to be a Protestant, or between two Protestants, is null.

MIXED MATHEMATICS, a name given the purely scientific principles of mathematics when applied and intermixed with physical considerations. Such are hydrostatics, optics, and navigation.

MIXED RACES. The subject of *mixed races* is one intimately connected with an enlarged study of ethnology. It involves a consideration of the phenomena attendant upon the sexual union between individuals belonging to different varieties of the human race; as, for instance—adopting the classification of Blumenbach—between the European and the negro or the American Indian; or between the American Indian and the negro; or between any of these three and individuals belonging to the Malay and Mongolian varieties. It is well understood that such unions are in general prolific; and not only so, but that their offspring is likewise prolific; and this fact is much relied upon by some ethnologists as an argument in favor of the unity of the human race. They reason thus: Were the different varieties of mankind distinct species, as has been frequently alleged, then it would necessarily follow that the offspring of such unions would prove as unfruitful as those between the horse and the ass, the goat and the sheep, the wolf and the dog; and similarly with respect to the hybrids among birds, insects, and plants. To sum up, in the words of Dr. Prichard, the best exponent of this school of ethnology: "It seems to be the well-established result of inquiries into the various tribes of organized beings, that the perpetuation of hybrids, whether of plants or animals, so as to produce new and intermediate tribes, is impossible. Now, unless all these observations are erroneous, or capable of some explanation that has not yet been pointed out, they lead, with the strongest force of analogical reasoning, to the conclusion that a number of different tribes, such as the various races of men, must either be incapable of intermixing their stock, and thus always fated to remain separate from each other, or, if the contrary should be the fact, that all the races to whom the remark applies, are proved by it to belong to the same species." Dr. Prichard further observes, that so far from such unions between members of different varieties of the human race proving unfruitful, or their offspring unfruitful, the very opposite is the case, as, for instance, in unions between the negro and the European, the most strongly marked varieties of our race. "If we inquire," he says, "into the facts which relate to the intermixture of negroes and Europeans, it will be impossible to doubt the tendency of the so-termed mulattoes to increase. The men of color, or the mixed race between the creoles and the negroes, are in many of the West India islands a rapidly increasing people, and it would be very probable that they will eventually become the permanent masters of those islands, were it not for the great numerical superiority of the genuine negroes. In many parts of America they are also very numerous." It is to America, indeed, both North and South, that we must chiefly look for the numerous and varied phenomena resulting from this intermixture of races; for there we have not only the negro and the European mingling their blood, but the negro and the American Indian, the European and the Indian, and the offspring of each of these with the offspring of the other, or with members of either of the parent stocks; added to which, of late years, the Chinese (of Mongolian race or variety) have appeared upon the scene, thus contributing greatly to the number of what are termed *human hybrids*. All these, however, are not equally fertile; and with respect even to the mulattoes, it is alleged by writers of the Morton school of ethnology that they do not perpetuate themselves for many generations. "Nature," says Squier, rather dogmatically, "perpetuates no human hybrids—as, for instance, a permanent race of mulattoes." And Dr. Nott, adopting the classification of species laid down by Dr. Morton—namely, *remote species*, in which hybrids are never produced; *allied species*, which produce, *inter se*, an unfertile offspring; and *proximate species*, which produce with each other a fertile offspring—is of opinion that it is only by the union of southern or dark-skinned Europeans with negroes that thoroughly prolific mulattoes are engendered, which is not the case in unions occurring between individuals of the Anglo-Saxon and negro races. In arriving at this conclusion, we cannot help thinking that the author has been helped forward by the strong prejudice existing in the southern states against all taint of negro blood. A more impartial writer, prof. Wilson, in his *Prehistoric Man*, observes: "There are upwards of 4,000,000 of people of African blood in the United States, and certainly not less than 10,000,000 throughout the continent and islands of North and South America, and of these the larger proportion consists of hybrids. . . . It is impossible to determine with certainty how far the hybrid colored population of the United States is capable of permanency, either by the development of a fixed hybrid type, or by continuous fertility, until the predominant primary type reasserts its power, by their return to that of the original white or black parent, so long as the mixed breed is constantly augmented in the southern states by means at variance with the natural and moral relations of social life." As it is, the weight of evidence appears to be in favor of Dr. Prichard's views; but until the doctrine of hybridity is better understood, and a more satisfactory answer to the vexed question, "What is species?" has been supplied to us, we must deem it idle to pronounce dogmatically on the subject. See HYBRID and SPECIES. We conclude with a list of half-castes given by Dr. Tschudi, "with a few additions from other sources," printed in the appendix to prof. Wilson's valuable work just mentioned.

Father.	Mother.	Half-caste.
White	Negro	Mulatto.
White	Indian	Mestizo.
Indian	Negro	Chino.
White	Mulatto	Cuarteron.
White	Mestiza	Creole, only distinguished from the white by a pale brown complexion.
White	Chinese	Chino-blanco.
White	Cuarterona	Quintero.
White	Quintera	White.
Negro, N. A.	Indian	Zambo or Cariboco.
Negro, S. A.	Indian	Mameluco.
Negro	Mulatto	Zambo-negro or Cubra.
Negro	Mestiza	Mulatto-oscuro.
Negro	Chinese	Zambo-Chino.
Negro	Zamba	Zambo-negro (perfectly black).
Negro	Cuarterona	Mulatto (rather dark).
Negro	Quinterona	Pardoc.
Indian	Mulatto	Chino-oscuro.
Indian	Mestiza	Mestizo-claro (frequently very beautiful).
Indian	China	Chino-cholo.
Indian	Zamba	Zambo-claro.
Indian	China-cholo	Indian (with short frizzly hair).
Indian	Cuarterona	Mestizo (rather brown).
Indian	Quintera	Mestizo.
Mulatto	Zamba	Zambo.
Mulatto	Mestiza	Chino (of rather clear complexion).
Mulatto	China	Chino (rather dark).

MIXTE'CAS, the name of an ancient Indian race, said to have migrated from the north and settled in Mexico, populating that part of the republic which is now included in the states of Puebla, Guerrero, and Oajaca. They were an industrious people; were divided into independent bands, each with its own chief; and were inclined towards an advanced state of semi-civilization. They built cities, temples, and fortifications, the remains of which are significant of their capacity and progress. They possessed a religion, and conducted certain rites in mountain caves, and they included the idea of a heaven, which they named Sosola, in their theology. This race still exists, retaining a portion of its ancient territory, but has been driven from Puebla by the Mexicans, and in some instances forced to retire into Guatemala. Their language is similar to the Zapoteca, but simpler, although it has a number of dialects. The Mixtecas inhabit a region surrounded by mountain ranges, and are peaceable and industrious, not concerning themselves in the political disturbances which are so frequent in Mexico. Their principal cities are Tepascoluta, Yanhuistlan, Ilaxiaco, and Huajuapan.

MIXTURE, an organ stop, consisting of from two to five ranks of small metallic pipes. It is generally found in large organs, and resembles the sesquialtera and furniture stops, except that it is much higher and shriller. Like other compound stops, the two smaller ranks of the mixture stop change on the upper part of the organ scale into an octave lower. This is necessitated from the fact that the pipes in their upper ranks would produce too small a volume of sound.

MIXTURES are officinal preparations, extempore in their nature, some of which—as, for example, *mistura camphoræ*, *mistura cretæ*, and *mistura ferri composita*—are very extensively used in medical practice, either as vehicles for more active remedies, or for their intrinsic value.

MIZZEN, or MIZEN, the sternmost of the masts in a three-masted vessel, and also the smallest of the three. Above it are the mizzen-topmast, the mizzen-top-gallant-mast, and the mizzen-royal. It supports the usual yards, and, in addition, the gaff and boom of the spanker (q.v.). A rear-admiral hoists his pendant at the mizzen.

Although the word mizzen is now applied adjectively to the several parts, it appears formerly to have been the name of a large triangular sail carried in the stern, and thence to have become the distinguishing title of the mast which bore that sail. The name is probably from It. *mezzano*, mean, in the middle; in opposition to a square sail which lies across the vessel.

MNEMO'NICS. See MEMORY.

MNEMOSYNE, in classical mythology the goddess of memory, and the mother of the Muses (q.v.), whom she bore to Jupiter. The principal seat of her worship was at Eleutheræ, in Bœotia.

MOA, the name given by the New Zealanders to the large wingless or struthious birds (see BREVIPENNES) of which the bones are found imbedded in the sands of the sea-shore, in swamps, forests, river-beds, and limestone caves, and of which traditions subsist among them as birds living in their country. The largest bones belong to the genus *Dinornis* (q.v.), others to *Palapteryx* (q.v.); and with them are found bones of a large bird (*Aptornis*) resembling a swan, supposed to be now extinct, also of the existing species of *Apteryx* (q.v.) and of *Notornis* (q.v.), much smaller birds. It is generally supposed that no large moas have been seen alive since about 1650; but it has recently been again alleged that some have been seen, and rewards have been offered for the capture of them. They are represented by the New Zealanders as stupid, fat, indolent birds, living in forests, mountain fastnesses, etc., and feeding on vegetable food. Their feet are said to have been adapted for digging. They seem to have been extirpated for the sake of their flesh, feathers, and bones. The eggs were eaten. The leg-bones of the moas were filled with marrow, and not with air, as those of other birds.

MO'ABITES, a pastoral people, who inhabited the mountainous country e. of the lower part of the Jordan and of the Dead sea. Their *cultus* was characterized by many very odious rites, among which was human sacrifice. In the time of the Judges, the Jews were for eighteen years under the yoke of the Moabites, who were afterwards made tributary by David, but, about 900 B.C., shook off their allegiance to the Jewish kings, and afterwards took part with the Chaldeans against the Jews. Their name no longer exists, and the remnants of the people have long been included among the Arabs.

MOABITES (*ante*), the descendants of Moab, son of Lot, whose primitive dwelling-place was Zoar, on the south-eastern border of the Dead sea. Gradually supplanting the original inhabitants, they obtained possession of the fertile highlands—extending 40 or 50 m. in length by 10 in width on the e. of the Dead sea—and of the plains below. From the most elevated part of this territory they were expelled by the Amorites, who allowed them to retain only the southern half of the table-lands and the plain. This restricted region was strongly fortified by nature, having on the n. the chasm of the Arnon; on the w. cliffs, almost perpendicular, by the side of the Dead sea, intersected only by a few steep and narrow passes; and on the s. and e. semi-circular hills, through which pass only a branch of the Arnon and the wadys or valleys that go down to the sea. Beyond these hills lay a vast extent of uncultivated pasture-grounds, described in the book of Numbers as the wilderness which faced Moab on the east. Through this Israel seems to have approached the promised land, without traversing Moab itself, but taking their position n. of the Arnon. Here they remained during their operations against Bashan. It was at this time that Balak, king of Moab, in his fear of Israel, sent for Balaam to curse them, and for the Midianites to make war against them. From the plains of Moab Moses ascended to the top of Pisgah to view the promised land; in the land of Moab he died; somewhere in a valley of that land, over against Beth peor, he was buried; and in the plains of Moab all Israel wept for him 30 days. After the conquest of Canaan, Eglon, king of Moab, with the assistance of the Ammonites and Amalekites, gained possession of Jericho and ruled over Israel 18 years. From this bondage they were delivered under the leadership of Ehud, a Benjamite, who killed Eglon secretly, and aroused the people to a victorious conflict in which 10,000 Moabites were slain. Afterward peace and friendship between the nations were restored. While the judges ruled, Jews sometimes took refuge in the land of Moab; and long afterward, when David was hard pressed by Saul, he obtained from the king of Moab a temporary asylum for his father and mother. Saul waged war successfully against the Moabites, and David made them tributary. After the revolt of the 10 tribes, the kingdom of Israel levied this tribute, and when, on the death of Ahab, the Moabites refused to pay it, Jehoram, with the help of Judah and Edom, attempted to hold them in subjection. The Moabites, in revenge, formed a powerful confederacy against Judah, but the different armies which composed it, panic-stricken, turned their arms against each other. Still later, they acted against the Jews as auxiliaries of the Chaldeans, under Nebuchadnezzar: yet this monarch, according to Josephus, five years after the capture of Jerusalem, made war also upon them, and subdued them. After the return of the Jews from captivity, they formed an intimate connection with the Moabites by intermarriages, which, however, the zeal of Ezra and Nehemiah broke up. Josephus mentions the cities between the Arnon and Jabbok as cities of Moab. Thenceforth they were almost lost to view among the Arabians; and for many centuries little was known concerning the region in which they lived. Even in more modern times few travelers ventured to explore it. Seetzen, in 1806, at the risk of his life, shed a new and unexpected light upon it. He found many ruined places still bearing the old names. In 1812 Burckhardt made the same tour from Damascus to Karak, and from that point advanced to Petra. From these and subsequent travelers we learn that the plains are covered with the sites of towns on every eminence or spot suitable for one. The land is capable of rich cultivation. The form of fields is still visible, and there are remains of Roman highways which are in some places completely paved, and on which there are mile-stones of Trajan, Marcus Aurelius, and Severus, with the numbers legible upon them. Denunciations against Moab were made by Balaam, Amos, Isaiah, Jeremiah, Ezekiel, and other prophets, who during its highest prosperity foretold that its cities should become desolate without any to dwell in them; and at the present day, while the sites, ruins, and names of many of its ancient cities can be traced, not one of them has been found inhabited by man. At the present time the American engineers of the Palestine exploration society are engaged in making a scientific survey and exploration of the land.

MOABITE STONE, The, a stone bearing a long inscription in Hebrew-Phenician letters, discovered at Dibân, in Moab, in 1868. It appears to have been erected by Mesha, king of Moab, mentioned in 2 Kings, vii., and the inscription refers to his wars with Israel (in the 10th c. B.C.). The negotiations set on foot for its purchase led to quarrels among the Arab tribes claiming an interest in it, and the memorial was unfortunately broken to pieces. The fragments, however, were with great difficulty collected, and are now preserved in the Louvre.

MOABITE STONE, The (*ante*). The authenticity of this stone, disputed on grounds which have little to do with true critical research, is now universally acknowledged. Its date may be taken as 890 B.C., and is almost the same as that of the inscriptions on the lions of Birs Nimrûd, that is, the reigns of Ashurnazirpal and Shalmanezar IV. Its characters are like those of the fourth Malta inscription, and again like that from Nora, in Sardinia. We have, then, in the 9th c. B.C., one single and same type of letter in use for current purposes from Sardinia to Assyria, which, about the 6th or 7th c., gives rise to the second form, or true Phenician, and to the old Hebrew of coins and gems, whose modern representative is the Samaritan. The stêl of Mesha contains all letters except Teth, and which, showing few dialectic variations, appears to stand, in willingness to express vowels, between the Hebrew and the Assyrian, without the parsimony so distinctive of the Phenician. There is a translation by Dr. Ginsburg in *Records of the Past*, vol. xi.

MOAT, the ditch round the ramparts of a fortress, may be either wet—i.e., full of water—or dry. In the latter, which is the commoner case, the depth should not be less than 12 ft., nor the width under 24. The more perpendicular the walls, so much the greater will be the obstruction to the enemy. In regular works the walls are usually revêted with masonry, that at the foot of the rampart being the scarp or escarp, and that below the covered way the counterscarp. See Ditch and Fortification.

MOAWIYAH, Caliph, 610–80, b. Mecca; son of an Arab chief of distinguished birth, and distantly related to Mohammed. He was made governor of Syria in 641, and during his term of office conquered the island of Rhodes, but lost Cyprus. On the proclamation of Ali as the successor of the caliph Othman in 655, Moawiyah revolted, and attempted to make himself caliph. He succeeded in getting control of most of the provinces of the empire, and took possession of Samarcand and Bokhara. His army, after making extensive conquests, was unable, after a long siege and repeated assaults, to capture Constantinople, and in 678 he entered into a treaty of peace. Moawiyah not only exerted absolute control over the Saracen empire, but succeeded in having the caliphate declared hereditary in his family.

MOBERLY, George, D.C.L., b. St. Petersburg, 1803; son of an English merchant. He was educated at Winchester and Oxford. In 1826 he took the Oxford chancellor's prize for the best English essay, choosing for his subject, *Whether a Rude or a Refined Age is the more Favorable to the Production of Works of Fiction.* He took the degree of M.A. in 1828 and of D.C.L. in 1836. After a connection of some years with Balliol college, as tutor and fellow, he became, in 1835, head-master of Winchester school, where he remained until 1866. He was then presented with the living of Brixton in the isle of Wight, and in 1868 became a canon of Chester cathedral. In 1869 he was consecrated bishop of Salisbury. Of his numerous published works the most important are: *A Few Remarks on the Proposed Admission of Dissenters into the University of Oxford*, 1834; *Sermons Preached at Winchester College*, 1844; and *Sermons on the Beatitudes*, 1860. He delivered the Bampton lectures for 1868, which appeared under the title of *The Administration of the Holy Spirit in the Body of Christ;* and he was one of the "five clergymen" who published revised versions of various books of the New Testament between 1857 and 1870.

MO'BILE, Mobilize', an adjective and verb, used respectively in regard to continental armies, to designate a state of readiness for taking the field, and the act of making ready for such an operation. The process consists in augmenting a regiment from its peace to its war complement, in calling in men on furlough, in organizing the staff of divisions and brigades, constituting the commissariat, medical, artillery, and transport services, and in accumulating provisions and munitions. As the work of mobilizing an army causes great and inevitable expense, it is only resorted to when hostilities appear imminent.

MOBILE, a co. in s.w. Alabama, having the state line of Mississippi for its western border, the Mobile bay and the Mobile river flowing into it for its e. boundary, and the gulf of Mexico on the s.; drained by the Escatowpa river; 1500 sq.m.; pop. '80, 48,602—44,709 of American birth, 21,426 colored. It is intersected by the Mobile and Ohio railroad, the New Orleans, Mobile and Texas, and the Mobile and Alabama Grand Trunk. Its surface is generally level, a large proportion being covered with pine forests growing on sandy hills. Its climate is healthy, and the water is pure. Live stock is raised. All the products of the southern states are found here, the soil being a productive, sandy loam. Lumber and rice are the chief products. Dauphin island lies directly s., the site of a French settlement in 1702, called Massacre island from the quantities of bones found there, and was the occasional seat of the colony of Louisiana in early times. From its county seat steamboats run to Montgomery, Tuscaloosa, and New Orleans, carrying on an important commerce. Its bay will admit vessels of 21 ft. draught, and the harbor of Mobile vessels drawing 13 ft., and cotton is largely exported; also, cigars, staves, shingles, resin, and turpentine. Its industries include the manufacture of tin, copper, engines and boilers, tar, and turpentine. Seat of justice, Mobile.

MOBILE, the principal city and only seaport of Alabama, is situated on the w. side of Mobile river, and at the head of Mobile bay, which opens into the gulf of Mexico. It is built with broad shaded streets on a sandy plain, rising gradually from the river, with a fine custom-house and post-office, city hall and market-house, theater, odd fellows' hall, cathedral, 30 churches, 4 orphan asylums, several hospitals, a medical college, St. Joseph's college (a Jesuit institution), a convent of the visitation, and academy for young ladies. Mobile has several ship-yards, foundries, and cotton-presses. Its chief business is the export of cotton. The average export for five years preceding the civil war was 632,308 bales; in 1874–75, 131,343 bales, value $9,054,110, were exported. There is also a large exportation of turpentine, resin, and tar. Its harbor is defended by fort Morgan. Mobile was settled by the French in 1702. Pop. '70, 32,034.

MOBILE (*ante*). The city is 6 m. in length by 2 or 3 broad; pop. '80, 31,205; a decline from 1870 of 729. It is chiefly inhabited along the line of the river and to a distance of about a mile inland; is lighted by gas, and has an excellent water supply from a distance of 5 m.; it has also sufficient horse-railroad facilities for its local need. Mobile is connected with the general railroad system of the country by the Mobile and Ohio, Mobile and Montgomery, New Orleans, Mobile and Texas, and Alabama Grand Trunk railroads. There are also steamers to Montgomery and other river towns.—The following tables display the trade of Mobile from 1867–68 to 1874:

RECEIPTS AND SHIPMENTS—BALES OF COTTON.

Years.	Receipts.	Shipments.		
		To Foreign Ports.	To Domestic Ports.	Total.
1868–69	230,621	163,154	84,194	247,348
1869–70	306,061	200,838	97,685	298,523
1870–71	404,673	287,074	130,429	417,503
1871–72	288,012	137,977	157,652	295,629
1872–73	332,457	132,130	197,131	329,261
1873–74	299,578	132,367	172,222	304,589

VALUE OF EXPORTS AND IMPORTS.

Years.	Exports.	Imports.
1867	$22,101,601	$385,530
1868	22,611,973	566,225
1869	20,541,450	511,297
1870	22,422,631	1,447,516
1871	21,874,703	1,811,614
1872	13,954,600	1,761,657
1873	12,249,866	1,097,164
1874	10,282,784	886,411

By these tables it is to be observed that from 1870 to 1874 there was a general decline in the foreign trade of Mobile, as there was a falling off in the population between 1870 and 1880, according to the tenth decennial census. The early history of this city displays more than the usual proportion of disturbing influences. Originally colonized by the French, it was long the most important point in the Louisiana settlement. It was attacked by famine and by epidemic; and in 1706 was the scene of that exceptional revolt known as the "petticoat insurrection," when the women of the place became dissatisfied with Indian corn as their staple article of food, and threatened rebellion. A disastrous hurricane, accompanied by a flood, nearly destroyed the settlement in 1711, and necessitated its removal from the place where it then stood, supposed to have been a point some 20 m. from its present location. By the treaty of Paris in 1763, Mobile was transferred to the British government; but twenty years later it was ceded to the Spanish government, with all the rest of the British possessions on the gulf, and remained in the possession of Spain until 1813, when it was surrendered to gen. Wilkinson. In 1819 it was incorporated as a city. From Jan. 11, 1861, to April 11, 1864, Mobile was in the hands of the confederates. On Aug. 5, in the latter year, admiral Farragut, with his fleet, passed up Mobile bay, and the memorable engagement with the forts and the confederate ships ensued, resulting in the destruction or capture of the latter, and the surrender of forts Gaines and Morgan. Early in the following spring the place was fully invested, and the remaining fortifications carried by assault.

MOBILE BAY (*ante*), an estuary of the gulf of Mexico, in the s.w. portion of the state of Alabama. The island of Dauphin lies on the w. of the entrance, and on the e. is Mobile point, the station of a light-house with a revolving light 55 ft. high. It has an outlet on the s.w. through Grant's pass, communicating with Mississippi sound, used by steamers of light draught, and the regular course of the Mobile and New Orleans steamers. The bar, 4 m. seaward, will admit vessels of from 18 to 20 ft. draught. The depth of the bay is from 12 to 14 ft. more shallow in the n. portion than in the s., the anchorage for the cotton fleet being near the entrance, where they are loaded by lighters from Mobile. It is fed by numerous affluents of the Alabama river, flowing into the n. portion, over mud flats, changing with each season, and increasing the sedimentary deposits of the bay. At Choctaw pass, where the Mobile river enters the bay, a channel through the bar is maintained by dredging, and similar means render the Dog river navigable. Its margins are thickly wooded with groves of live oak and magnolia, especially near the n. extremity, and pine forests crown the high bluffs which rise in other portions.

MOBILE POINT, at the e. extremity of the entrance to Mobile bay, is the end of a long, narrow strip of sand which stretches between Navy Cove and the bay of Bon Secours to the n., and the gulf of Mexico to the south. Fort Morgan is situated here, on the ground once occupied by fort Bowyer. The latter fort, which was rudely and unscientifically built, was attacked from the sea in Sept., 1814, by a British squadron of 2 brigs, and 2 sloops of war, and on the land by a force of 130 marines and 600 Indians. The American garrison, numbering but 130 men, under maj. Lawrence, and defended by 20 pieces of artillery, sustained for 3 hours the attack of the British, who were forced to withdraw with a loss of 232 killed and wounded; and their flag-ship was grounded and burned. The American loss was 8. Fort Bowyer was finally captured by the British, Feb., 1815.

MOBILE RIVER AND BAY of Alabama. The river is formed by the confluence of the Alabama and Tombigbee, 50 m. above Mobile, which lies at its mouth. It is a sluggish stream, with low banks and several channels. The bay is 30 m. from n. to s., and 10 or 12 from e. to west. The entrance from the gulf of Mexico, 3 m. wide, is defended by fort Morgan and fort Gaines.

MOBILE RIVER (*ante*), formed in the s. extremity of Clarke co., Ala., is the boundary line between the counties of Mobile and Baldwin, and is navigable by large steamboats. Throughout its course it takes a s. direction, and, 6 m. below the junction of the rivers which form its head, it divides into two branches; the e. being called Tensas, the w. Mobile, the latter a name derived from the *Mauvilians* or *Mobilians*, a tribe of Indians.

MOBILIER, CRÉDIT. On Nov. 18, 1852, the French government sanctioned the statutes of a new bank under the name of the *Société Général de Crédit Mobilier*. The name was intended as a contrast to the *Sociétés de Crédit Foncier*, which are of the nature of land banks, and advance money on the security of real or *immovable* property; while the *Crédit Mobilier* proposed to give similar aid to the owners of *movable* property. The declared object of this bank is especially to promote industrial enterprises of all kinds, such as the construction of railways, sinking of mines, etc. Various privileges were conferred upon it under its charter; in especial, it was allowed to acquire shares in public companies, and to pay the calls made upon it in respect of such shares by its own notes or obligations; also to sell or give in security all shares thus acquired. The operations of the society were conducted upon a very extensive scale. In 1854 it subscribed largely to the government loan on account of the Russian war, to the Grand Central railway company, to the General Omnibus company of Paris, and to various other important undertakings. The dividend for this year was 12 per cent. In 1855 it lent two sums to the government—the one of 250 and the other of 375 millions of francs. Its operations were vast during this year, and the dividends declared amounted to 40 per cent. The directors had not hitherto availed themselves of their privilege of issuing their own obligations, but this they now resolved on doing. They proposed to issue two kinds—the one at short dates; the other at long dates, and redeemable by installments. The proposed issue was to amount to 240 millions of francs; but the public became alarmed at the prospect of so vast an issue of paper-money, so that in Mar., 1856, the French government deemed it necessary to prohibit the carrying out of the proposed scheme. This was a severe blow to the institution. In 1856 its dividends did not exceed 22 per cent; in 1857 they were only 5 per cent. Several attempts had been made to resuscitate its credit, but failed. In 1875 it was put under a new board of management, who reported its assets at 77,000,000 francs. In 1876 the 500-franc shares were quoted at 200 francs. The Crédit Mobilier has undoubtedly been highly useful in developing the industrial power of France, but its operations have been hazardous, and had they not been checked in time, they would in all probability have ended in disaster.

MÖBIUS, August Ferdinand, 1790–1868, b. Germany; educated at Leipzig, where he was professor of astronomy from 1815. He reorganized the Leipzig observatory, and published a number of astronomical treatises, of which the best known are *Elements of Celestial Mechanics*, 1843, and *Principles of Astronomy*. His *Manual of Statics* treats of the relation between geometry and statics.

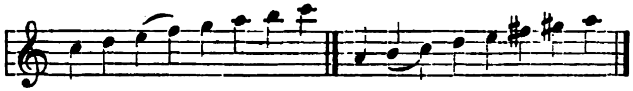
MOCCASIN SNAKE or Water Moccasin, also called *cotton mouth*, the *ancistrodon piscivorus*, a venomous serpent inhabiting the southern part of the United States. It has a length of about 2 ft.; color dark brown above and a gray belly. It lives in swamps and wet places and frequents the water. It is one of the most aggressive of all serpents, and its bite is of the most dangerous character.

MO'CHA, the most strongly fortified seaport, and once the capital, of the province of Yemen, in Arabia. It is situated on the Red sea, at the head of a little bay near the strait of Bab-el-Mandeb, and 130 m. w.n.w. of Aden (q.v). All round the shore is a hot sandy waste. The principal trade is in coffee, of which 10,000 tons (of the finest quality) are annually exported to Jiddah, Suez, and Bombay. Other exports are dates, gums, balm, ivory, senna, etc. Pop. 5,000.

MOCHA STONES are pieces of agate or of chalcedony, containing dendritic infiltrations, often assuming appearances very like finely ramified confervæ, etc. They receive the name mocha stone because, when they first became known in Europe, they were brought from Mocha. Of the same nature with mocha stones are *moss agates*. The resemblance of the inclosed infiltrations to plants is often merely accidental, but it appears to be sometimes really due to plants, which were inclosed in the cavity in which the silicious mineral itself was formed.

MOCKING-BIRD, or Mocking-Thrush (*Mimus* or *Orpheus*), a genus of birds of the family *merulidæ*, having a more elongated form than the true thrushes, a longer tail, shorter wings, and the upper mandible more curved at the tip. They are all American. The best known species, the mocking-bird of the United States (*M. polyglottus*), is about the size of the song-thrush; the upper parts of a dark brownish ash color, the wings and tail nearly black, the under parts brownish white. The mocking-bird is common in all parts of America, from the s. of New England to Brazil; n. of the Delaware, it is only a summer visitant, but in more southern regions it is found at all seasons. It is one of the most common birds of the West Indies, and its exquisite song fills their groves with melody by night, for which reason it is there very generally known as the nightingale. By day, the mocking-bird is generally imitative, excelling all birds in its power of imitation, now taking up the song of one bird, and now of another, and often deceiving the most practiced ear by its perfect performance. By night, its song is for the most part natural. It does not confine itself, however, to musical strains; it seems to take equal pleasure in repeating the harshest cries of the feathered tribes; and in domestication readily adds to its accomplishments the imitation of almost any sound which it is accustomed to hear, passing from one to another with great rapidity, so as to produce an incomparable medley. The mocking-bird readily learns to whistle a tune, even of considerable length, but there is no well-authenticated instance of its imitating the human voice. The barking of a dog, the mewing of a cat, the crowing of a cock, the cackling of a hen, the creaking of a wheelbarrow, are all within the compass of its powers. During its performances, it spreads its wings, expands its tail, and throws itself about as if full of enthusiasm and enjoyment. The mocking-bird is vocal at all seasons of the year. It enjoys almost everywhere the protection of man, and often makes its nest in a tree or bush close beside a house. Two or three broods are produced in a year. The male is extremely attentive to his mate, and manifests extraordinary courage in driving away enemies from the nest. Mocking-birds often assemble on such occasions, and birds of prey, far superior to them in size and strength, are compelled to retreat. Snakes are killed by reiterated blows on the head, and cats learn to consider the vicinity of a mocking-bird's nest unsafe. The food of the mocking-bird consists chiefly of berries and insects. Another species of mocking-bird is found in the Rocky mountains, and species of the same genus are among the finest song-birds of the temperate parts of South America.

MODE, in music. Every musical passage is referable to and forms part of a succession of sounds having some appreciable relation to one another. This succession of sounds is called the scale, and is a series of steps leading from a given note called the key-note, or tonic (q.v.), to its octave. The steps or degrees of the scale are of unequal size, and on the place of the smaller ones or semitones depends the mode of the music. Taking our natural scale, there are only two notes in it which can satisfy the ear as key-notes—viz., C and A. In the major mode, with C as key-note, the semitone or small interval falls between the third and fourth sounds; in the minor mode, with A as key-note, it falls between the second and third sounds; in the former case, the third of the key-note is a major third, in the latter a minor third. The minor mode further requires to be modified by occasionally sharpening its sixth and seventh, in order to be pleasing to modern ears. The scale of the major mode is derived from simpler harmonic proportions than that of the minor. Melodies composed in the latter mode have generally more or less of a plaintive or melancholy character. For the theory of these modes, see Music. Ancient musicians admitted of a greater variety of modes. The Greeks had six, designated the Dorian, Phrygian, Lydian, Mixo-Lydian, Ionic, and Æolian. The Ionic is the modern major, the Æolian the minor mode; the others are more or less intolerable to a modern ear. They are used to a limited extent in the music of the Greek church, and in the Ambrosian chant.



Major mode. Minor mode.

MODE (*ante*), in music, a term applied to the two varieties, major and minor, of the diatonic scale, or series of tones employed in modern music. It is more rarely used for key, as "the twelve major and twelve minor modes or keys." In the old Greek music each note could become, as in the modern, the key-note of a new key or scale; but, as there was no introduction of new semitones, this change of key became a change of mode in the same sense as our major and minor. At first there were only four Greek modes—the Dorian, Phrygian, Lydian, and Myxo-Lydian—but later the Ionian and the Æolian modes were added. St. Ambrose chose the first four for use in the church in the 4th c., and St. Gregory introduced the others 200 years later. They were termed ecclesiastical modes, and gave rise to the eight "Gregorian tones" or chants.

MOD'ELING is the process of preparing the original pattern or design from which a work in sculpture is to be cast or carved: the technical details will be found under Sculpture. Modeling is also practiced by medalists; the head or figure intended to be cut in the die being first modeled in relief with wax on a piece of slate. Goldsmiths, silversmiths, and jewelers also model intricate and artistic forms and ornaments of pieces of plate, to be cast and chased by them, or in which jewels are to be set. Wax is the substance used when delicacy and minuteness are required. Modeling is also a branch of the potter's trade. Flaxman modeled for Wedgwood numerous figures and groups in wax. For large models, the material employed is potter's clay, which, when used by sculptors, is mixed with a portion of sandstone, finely pulverized, to make it work freely.

MODENA, formerly a duchy of Italy, in the n., between the Po and the Mediterranean. It was bounded on the n. by Lombardy and the papal states, on the e. by Tuscany and the papal states, on the s. by Tuscany, Sardinia, and the Mediterranean, and on the w. by Sardinia and Parma. Area, 2,371 sq.m.: pop. in 1860, about 600,000. The only rivers of importance are the Margra and the Serchio, which empty into the Mediterranean. The n.e. part of the duchy is fertile, like the Lombard plain, to which it belongs. The vine is extensively cultivated, and the other chief productions are wheat, maize, hemp, and flax. For the history of the duchy, see Modena, the capital. The modern province of Modena comprises the provinces Modena and Frignana of the old duchy. Area, 966 sq.m.; pop. '72, 273,231.

MO'DENA (anc. *Mutina*), capital of the former duchy of same name, a fortified city of Northern Italy, 24 m. w.n.w. of Bologna. Pop. '71, 30,854. It stands between the rivers Secchia and Panaro, in a pleasant plain, noted for its rich soil and salubrious air, and from its surrounding ramparts commands fine views of the Apennines. Although the social life of Modena is somewhat stagnant, it is, nevertheless, a most agreeable city. It lies on the famous Via Æmilia (see EMILIAN PROVINCES), by which it is divided into the old and new city, and is connected by a navigable canal with the rivers Secchia and Panaro. Among the public buildings may be noted the cathedral of St. Geminianus, the patron of the city, a structure of the purely Lombard style. The campanile or belfry is one of the great towers of Italy; it is a square turreted structure, 315 ft. in height, its entire façade being in white marble. The ducal palace, a picturesque structure of the 17th c., is adorned with an infinity of galleries, courts, and marble arches; it contains the splendid Biblioteca Estense, numbering 100,000 volumes, and 3,000 rare MSS.; also the valuable Este archives, a most important collection of mediæval records, collections of coins and medals of great antiquity, and an observatory. Schools of theology, law, medicine, and mathematics have replaced the university suppressed in 1821; there are also fine museums of natural history, a botanic garden, theaters, and good public baths. The trade of Modena is unimportant: the manufactured products are confined to linen and woolen fabrics, leather, hats, paper, glass, and pottery, besides silk manufactured to a much less extent than formerly. Modena is the birthplace of the great anatomist Fallopius, and the antiquary Sigonio.

The ancient history of Modena affords evidence that it enjoyed at an early period a considerable degree of prosperity; the splendor, wealth, and arts of the city of Modena being mentioned by Cicero, Pliny, and Strabo. In modern times Modena has shared more or less the various vicissitudes which befell Italy, and participated in the great internecine feuds of the country. In 960 a member of the great house of Este was proclaimed marquis of Modena, and in 1452 the then reigning marquis was created duke by the emperor Frederick III. In 1796 Modena formed part of the Cisalpine Republic, but was restored in 1814 by the congress of Vienna to the reigning family. The duchy had at that time an area of 2,310 sq.m., and a pop. of 586,000. In 1848 the duke of Modena was temporarily deprived of his rights; and in 1860 the population definitively expelled their unpopular ruler, who carried off all the property and valuables within his reach, including the silver handles of the palace doors. Modena is now a province of the kingdom of Italy: area 960 sq.m.; pop. '71, 273,231.

MOD'ERATOR, a term used in Scotch ecclesiastical law to describe the chairman or president of a Presbyterian church-court.

MODICA, the Mohac of the Saracens, a city of the island of Sicily, in the province of Val di Nota, 30 m. from Syracuse. Pop. '72, 33,169. The city, which stands perched amid rocks, contains several fine buildings, and, notwithstanding the humidity of the climate, the sanitary condition of the inhabitants seems satisfactory. The soil of the surrounding district is the most productive of Sicily, and yields vast quantities of corn, tobacco, oil, wine, hemp, which, with cheese, wool, soda, and butter, form the chief export trade of the place. The valley of Ipsica, or Ispica, in the vicinity of Modica, contains remarkable rocks, in which numerous dwellings are excavated.

MODIL'LION, an ornamental bracket much used in classic architecture, especially in the cornices of the Corinthian and Composite styles.

MODOCS, the name of a tribe of American Indians, meaning "enemies," and applied to them by a hostile tribe. The Modocs formerly belonged to the Klamaths (q.v.), but became estranged from them and eventually antagonistic. They are supposed to have originated on the shores of lake Klamath in California. They were dull and lethargic by nature, unimpressible, with little expression to their features, and little energy or activity in their movements and habits. They had the custom of making slaves of their prisoners of war, and of buying and selling these, after the fashion of the ancient Romans and Carthaginians. They had a religion, in which a mythical deity whom they called Komoose, stood in the place of a god. In 1847 and 1849 they are said to have conducted predatory excursions against the whites. A year later capt. Nathaniel Lyon fought a band of these Indians on Clear lake, Modoc co., Cal., and defeated them, inflicting severe and merited chastisement. But by 1852 the Modocs appear to have forgotten this infliction, or remembered it with an unwise disposition for vengeance, for they again indulged in a massacre of white settlers, and invited fresh retribution. This was effected in a manner not according to the laws of civilized warfare, however, for the Modocs were invited by the whites to attend a pow-wow and feast, presumably of a peaceful character, and, of the 46 who accepted the invitation, 41 were ruthlessly murdered. After this act warfare continued for many years. In 1856 a campaign against them was carried out by gen. Crosby, and a large number were slaughtered. This did not put an end to the war, however, which continued until 1864, when they acceded to the stipulations of a treaty, ratified and proclaimed early in 1870. By this treaty they agreed to give up their lands to the U. S. government, and to go upon a reservation to be set apart for them. They did, in fact, go upon two different reservations, but these were already occupied by their enemies, the Klamaths, a fact which kept them continually in trouble. Two chiefs had now begun to obtain considerable notoriety, not alone on the frontier, but among the settled states. These were capt. Jack, who was the leader of a band of Modocs that was making itself particularly obnoxious to the whites; and Schonchin, hereditary chief of the tribe, whose followers were less objectionable. In 1868 capt.

Jack, with his party, moved to Lost river, where they remained until 1872, when orders were given by the superintendent of Indian affairs to return them to the reservation. Troops from fort Klamath were sent against their camps, and after some fighting they were dislodged, and retreated to a district known as the "lava beds," near fort Klamath, Oregon, where they were enabled to strongly intrench themselves, owing to the peculiar natural formation of the country. On Jan. 17, 1873, the troops under gen. Wheaton entered the lava beds and attempted to drive out the Modocs, but with such ill success that they were even unable to approach nearer to them than a distance of 2 or 3 miles. The troops lost 11 killed and 21 wounded, and were forced to retire. A second attempt was made under the command of gen. Gillem, but this also resulted in failure. Commissioners were now appointed by the government to confer with capt. Jack, and endeavor to bring about a peaceful settlement of the existing troubles. A meeting was arranged for April 11, 1873, which took place according to appointment, but was treacherously concluded by the Modocs, who fired upon the commissioners, with the result of killing outright gen. Canby and Dr. Thomas, and wounding Mr. Meacham, also a commissioner. This act broke up the conference, and a fierce fight ensued, the Modocs resisting desperately until starved out and forced to surrender, an event which did not occur until nearly two months later. The troops during this part of the siege were commanded by gen. Jeff. C. Davis, to whom belongs the honor of having at length forced the stubborn savages to acknowledge their defeat. A military commission was now appointed to try the chief offenders, and capt. Jack, Schonchin, jr., and two other Modocs were condemned to die. They were accordingly executed at fort Klamath, Oct. 3, 1873. The remainder of the band were retired to a reservation in the Indian territory.

MODULA'TION, in music. When in the course of a melody the key-note is changed, and the original scale altered by the introduction of a new sharp or flat, such change is called modulation. Much of the pleasure of music is derived from a judicious use of modulation. The art of good modulation from one key to another consists in the proper choice of intermediate chords. Sudden transitions, without intermediate chords, should be employed but sparingly, and in peculiar circumstances. Every piece of music is composed in a particular key, in which it begins and ends, which generally predominates over any other keys that may be introduced in the course of the composition.

MOD'ULE, in classic architecture, an arbitrary measure for determining the proportions of the various members of the orders. The diameter, semi-diameter, or one-third of the diameter are most frequently used; the first being usually divided into 60 parts (or minutes), the second into 30 parts, and the third into 20 parts.

MOD'ULUS, a constant coefficient or multiplier, by means of which one series or system of quantities can be reduced to another similar series or system. Thus we have the modulus of elasticity (q.v.), of friction (q.v.), and of systems of logarithms (q.v.). The system of logarithms which is universally accepted as the primary is Napier's, and from it all other systems are deduced in the following manner: Let N be a number of which the Napierian logarithm is b, e being the Napierian base, it is required to find the logarithm of N to some other base a. Let x be this logarithm, then (see LOGARITHMS) $N = e^b = a_x$, and, taking the Napierian logarithms of both sides of this equation, $b \log._e e = x \log._e a$, or (since $\log._e e = 1$) $b = x \log._e a$, therefore $x = \frac{b}{\log._e a}$; i.e., $\log._a N = \frac{\log._e N}{\log._e a} = \frac{1}{\log._e a} \times \log._e N$. This multiplier, or "modulus," $\frac{1}{\log._e a}$, is independent of N, and is therefore constant for the reduction of all Napierian logarithms to the system whose base is a. If $a = 10$, the multiplier becomes $\frac{1}{\log._e 10}$, the modulus of Briggs's, or the common system of logarithms, and is equal to $\frac{1}{2.30258509} = .4342944\ldots$

MO'DUS, in English law, means a peculiar custom by which lands become exempted from payment of tithes on paying some composition or equivalent.

MÖ'EN, a Danish island in the Baltic sea, separated from Seeland on the n.w. by the *Ulfsund*, and from Falster on the s.w. by the *Grönsund*. It is 19 m. long, by about 5 m. in average breadth. Area, 84 sq. miles. Pop. about 15,000, who are supported by agriculture, fisheries, and commerce. It has been called the Switzerland of Denmark, and is remarkable for the irregularity of its surface. The soil is fruitful. Its chief town and seaport, Stege, has a pop. '70, 1960.

MŒ'RIS, LAKE, the ancient name of a sheet of water in Egypt, now known as *Birket-el-Kerûn*, or *El-Korn* ("the lake of the promontory"), is situated in the province of Fayûm, about 50 m. s.w. of Cairo; extreme length from n.e. to s.w., 30 m.; breadth, 6 m.: it was formerly much larger. Its average depth is 12, and its greatest ascertained depth 28, feet. On the n. and w., its shores are rocky, but on the s., flat and sandy. It is connected with the Nile by a canal called *Bahr-Jusuf* ("the river of Joseph"). The waters are brackish, on account of their being impregnated with the alkaline salts of the desert, and with the muriate-of-lime depositions of the surrounding hills. In the time of the Pharaohs, the revenue derived from the fisheries was applied to the maintenance of the queen's wardrobe and perfumes. Under the Persians, they were let (during the season of the inundations, when the canal fed the lake) at £150 a day. At present, however, they only yield about £84 a year.

MŒ'SIA, an ancient Roman province, bounded by the Danube on the n., the Black sea on the e., the mountain-chains of *Hæmus* (Balkan) and *Orbelus* on the s., that of *Scardus* and the rivers *Drinus* (Drina) and *Savus* (Save) on the west. The river *Ciabrus* (Cibriz) divided it into two parts, of which the eastern (*Mœsia inferior*) is the present Bulgaria, and the western (*Mœsia superior*) is Servia. Its original inhabitants were mostly of Thracian race. Gaulish or Celtic invaders settled in western Mœsia about 277 B.C., under the name of *Scordisci*. The Romans first came in contact with the tribes of Mœsia after the conquest of Macedonia, when C. Scribonius Curio forced his way as far n. as the Danube, and gained a victory over the Mœsians (75 B.C.), but the country was not completely subjugated till 29 B.C. It was made a Roman province in the reign of Augustus, and flourished for more than two centuries, but as a frontier province it was much exposed to hostile invasions, and required a line of fortresses and stations all along the s. bank of the Danube. In 250 A.D. the Goths made an irruption into the country, and defeated and slew the Roman emperor, Decius. In the following year, and about the end of the 4th c., it was given up to them by the emperor Theodosius I. Slavonian tribes settled in Mœsia in the 6th and 7th centuries.

MŒSO-GOTHIC GOSPELS. See ULFILAS (*ante*).

MŒSO-GOTHS, the name given to the Goths who in the 3d c. settled in lower Mœsia at the mouth of the Danube. Ulfilas (q.v.) was a Mœso-Goth. The name, however, became of more general use to designate those who remained in Mœsia after the great migration in the beginning of the 5th century.

MOFFAT, a market t. and favorite watering-place of Scotland, in the co. of Dumfries, stands in the upper part of the broad and beautiful valley of the Annan, and is surrounded by hills of moderate elevation. It is 2 m. from the Beattock station, on the Caledonian railway, and 19 m. n.n.e. of Dumfries. Among other public edifices are the baths and the reading and assembly rooms. The mineral springs, the principal of which, like that of Harrogate, is saline and sulphurous, are highly celebrated; but perhaps the greatest attractions of the place are its salubrious air and exquisite environs. During the season the town is increased in population by from 800 to 1000 visitors, to suit whose convenience great numbers of elegant villas, commanding fine views of the neighboring country, have been erected. Pop. '71, 1730.—The Moffat hills extend between the counties of Lanark and Peebles in the n., and Dumfries in the s.; highest summit Hartfell, 2,650 feet. See Black's *Guide to Moffat.*

MOFFAT, ROBERT, a distinguished missionary, b. at Ormiston, East Lothian, Dec. 21, 1795. Having resolved to become a missionary to the heathen, he offered his services to the London missionary society, was accepted, and sent by them to South Africa. Arriving at Cape Town in 1817, he immediately proceeded beyond the boundaries of Cape Colony to Namaqualand, where he entered upon his labors at the kraal of Africaner, a chief whose name had long been a terror to the people of the neighboring districts of the colony, on account of the audacious raids which he made among their settlements, and his ferocious character, but who had lately become a convert to Christianity, and now showed a warm desire for its promotion. Here Moffat labored for three or four years with great success, Christianity and civilization advancing together. But the situation, on account of the drought and sterility of the country, and its very thinly scattered population, being unsuitable for a principal mission-station, he set out in search of a better locality, and labored at several stations in succession in the countries to the n. and n.e. of Cape Colony. Wherever he went, the gospel was gladly received by some of those who heard it, and in some places by many. In every place he also guided the people in the arts of civilized life. He made several missionary tours, and his adventures were very remarkable, and are graphically described in his work, *Missionary Labors and Scenes in Southern Africa* (Lond. 1842), which he wrote and published during a visit of several years to Britain, rendered necessary by the state of his health. In 1842 Moffat returned to his labors in that country, and came back to England in 1870. His daughter was the wife of the celebrated Dr. Livingstone. In 1873 he was presented with the sum of £5,800 in recognition of his great services. He lectured on African missions in the nave of Westminster abbey in 1875.

MOGADO'RE, or SUE'RRA, a fortified t., and the principal seaport of Morocco, 130 m. w.s.w. of the city of that name, on the Atlantic ocean. Pop. about 20,000. It is the port of the capital, and was founded in 1760, on the site of an old Portuguese fort It stands on a rocky promontory, opposite an island of the same name, long a haunt of pirates, which forms the harbor, and is said to be the best built town of the kingdom. Its streets are regular, though narrow, and it consists of two parts, each surrounded by water. The quarter called the Fortress contains the custom-house and the treasury, and is the residence of the pasha, the vice-consuls, and the Christian merchants. The town is defended by four batteries on the island, and by a fort on the land-side; the walls are also defensible. Mogadore is the seat of considerable trade; it exports olive-oil, wool, gum, hides, feathers, gold-dust, and almonds. In 1873, 114 vessels, of 28,907 tons, entered, and 211, of 27,913 tons, cleared the port. The value of the cargo of those entering was £263,718; of those clearing, £259,930. The imports are woolens, cottons, hardware, etc.

MOGILA, or MOGILAS, Peter, 1597–1646; b. Moldavia; educated at the university of Paris. After serving in the Polish army he went into a monastery at Kiev, and became metropolitan of that town in 1629. He brought to Kiev from Paris the improved methods of study and the more advanced theological studies which were as yet unknown to Russia. He set up a printing press, and founded an academy and a library, to which he gave his own collection of books. With a view to strengthen the Greek church, he published *A Confession of Faith*, which contains an exposition of its doctrines, and which remains a standard treatise on the theology of his church. He also wrote a *Catechism*, a partial hagiography, and a number of dramas in verse.

MOGUER' (Arab. "caves," of which there are many in the neighborhood), a t. of Spain, in the province of Huelva, 48 m. w.s.w. of Seville, rises gently above the Rio Tinto, near the mouth of which is its port, Palos. The streets are generally broad and straight, but both the town and castle are much dilapidated. The old Franciscan convent was ordered in 1846 to be preserved as a national memorial, but it is now fast going to ruin, and the wood of the cells stripped off. It was here, in 1484, that Columbus, craving charity, was received by the prior, Juan Perez de Marchena, by whose influence he was enabled to prosecute his discoveries, setting out from the port of Palos on Aug. 3, 1492. It was to this port also that he returned, Mar. 15, 1493, after having accomplished the great end of his expedition. Here likewise did Cortes land in May, 1528, after the conquest of Mexico and lodged in the same convent which gave shelter to Columbus. Palos is now a poor decayed fishing port. Moguer has some trade in wine and fruit. Pop. 6,600.

MOGUL', Great, the popular designation of the emperor of Delhi, as the impersonation of the powerful empire established in Hindustan by the Mongols (q.v.), who were called *Moguls* by the Persians. The first great Mogul was Baber, the great-grandson of Timûr, who founded the Mongol empire in Hindustan in 1526. In 1803 the great Mogul was deprived of his throne; in 1827, of even the appearance of authority, becoming a mere pensioner of the British; and in 1858, Mohammed Bahadûr, the last of the dynasty, was condemned, and transported for complicity in the Indian mutiny.

MOHACS', a market t. of Hungary, 110 m. s.s.w. of Pesth, on the western arm of the Danube. It contains a gymnasium, has an important cattle-market, is a station for steamboats on the Danube, and the seat of considerable trade in wine, coal, timber, and agricultural produce. Pop. '69, 12,140. It owes its historical importance to the great battle fought here, Aug. 29, 1526, between Louis II. of Hungary, with 25,000 Hungarians, and the sultan Soliman at the head of about 200,000 Turks. The battle resulted in the disastrous defeat of the Hungarians, who lost their king, 7 bishops, many nobles and dignitaries, and upwards of 22,000 men. A second battle was fought here on Aug. 12, 1687, when the Turks in their turn were defeated by an Austro-Hungarian army under Charles of Lorraine.

MO'HAIR, the wool of the Angora goat (see Goat and Angora), a native of Asia Minor. Few animals have so beautiful a covering as the fine, soft, silky, long, and always pure white wool of this goat. Each animal, at the annual clip in April or May, yields from 2 lbs. to 4 lbs. of wool. It is only within the last 30 years that mohair has been in great request in Britain, but its development as an article of trade has been simultaneous with that of alpaca. In 1876 the amount of mohair and other goats' hair imported was 5,848,199 lbs.; the value, £711,717. See Woolen Manufactures.

MOHAM'MED (Arab. *the Praised**), the name taken, at a later period, by the founder of Islam. He was originally called *Halabi*. He was born about the year 570 A.D., at Mecca, and was the son of Abdallâh, of the family of the Hâshim; and of Amina, of the family of Zuhra, both of the powerful tribe of the Koreish, but of a side-branch only, and therefore of little or no influence. His father, a poor merchant, died either before or shortly after Mohammed's birth, whom his mother then (according to a doubtful tradition) is supposed to have handed over, after the fashion of her tribe, to a Bedouin woman, that she might nurse him in the salubrious air of the desert. In consequence of the repeated fits of the child, however, which were ascribed to demons, the nurse sent him back in his third year. When six years old he also lost his mother. His grandfather, Abd-Al-Mutallib, adopted the boy; and when, two years later, he, too, died, Mohammed's uncle, Abu Talib, though poor himself, took him into his house, and remained his best friend and protector throughout his whole life. The accounts which have survived of the time of his youth are of too legendary a nature to deserve credit; certain, however, it seems to be that he at first gained a scanty livelihood by tending the flocks of the Meccans, and that he once or twice accompanied his uncle on his journeys to southern Arabia and Syria. In his 25th year he entered the service of a rich widow named Chadîdja, likewise descended from the Koreish, and accompanied her caravans—in an inferior capacity, perhaps as a camel-driver—to the fairs. Up to that time his circumstances were very poor. Suddenly his fortune changed. The wealthy, but much older, and twice widowed Chadidja offered him her hand, which he accepted. She bore him a son, Al-Kâsim—whence Mohammed adopted the name Abu Al-Kâsim—and four daughters: Zainab, Rukaija, Umm Kulthûm, and Fâtima; and afterwards a second son, whom he called Abd Manâf, after an idol worshipped among his tribe. Both his sons, however, died early. Mohammed continued his merchant's trade at Mecca, but without much energy, spending most of his time in solitary contemplations. In his 35th year he is said to have, by chance only, been chosen arbiter in a quarrel about the replacing of the sacred black stone in the Kaaba (q.v.); but not before his 40th year is there anything really important to be told of his life.

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* Or, according to Deutsch, whose view is fully corroborated and adopted by Sprenger in his *Leben und Lehre Mohammads*, in allusion to Hag. ii. 7, *the predicted Messiah*.

Before, however, entering on the weighty events of the subsequent period, it is by no means unimportant to advert to such traits of Mohammed's outward appearance as are yet recoverable. He was of middle height, rather lean, but broad shouldered, and altogether of strong build; slightly-curled black hair flowed round his strongly developed head; his eyes, overhung with thick eyelashes, were large and coal-black; his nose, large and slightly bent, was well formed. A long beard added to the dignity of his appearance A black mole between his shoulders became afterwards among the faithful "the seal of prophecy." In his walk he moved his whole body violently, "as if descending a mountain." His gait and presence were altogether of an extremely imposing nature. In his 40th year Mohammed received his first "revelation," or, in other words, became first aware that he had a "mission." About the year 600 A.D., Christianity had penetrated into the heart of Arabia, through Syria on the one, and Abyssinia on the other hand. Judaism no less played a prominent part in the peninsula, chiefly in its northern parts, which were dotted over with Jewish colonies, founded by emigrants after the destruction of Jerusalem; and round about Yathrib (Medina). Besides these two all-important religious elements, several sects, remnants of the numerous ancient sects which had sprung up everywhere during the first Christian centuries: Sabians, Mandeans, etc., on the frontiers of Syria and Babylonia, heightened the religious ferment which, shortly before the time of Mohammed, had begun to move the minds of the thoughtful. At that time there arose, according to undoubted historical accounts, several men in the Hedjaz (Waraka, Obeid Allah, Othman, Zayd, etc.), who preached the futility of the ancient pagan creed, with its star-worship, its pilgrimages and festive ceremonies, its temples and fetiches. It had in reality long ceased to be a living faith, and only the great mass of the people clung to it as to a sacred inheritance from times immemorial. The unity of God, the "ancient religion of Abraham," was the doctrine promulgated by these forerunners of Mohammed, and many of those who, roused by their words, began to search for a form of religion which should embody both the traditions of their forefathers and a purer doctrine of the divinity, turned either to Judaism or to Christianity. The principal scene of these missionary labors was Mecca, then the center of the pilgrimages of most of the Arabian tribes, and where, from times immemorial, long anterior to the city itself, the Kaaba (q.v.), Mount Arafat, the valley of Mina, etc., were held sacred—the Koreish, Mohammed's tribe, having the supreme care over these sanctuaries ever since the 5th century. It was under these circumstances that Mohammed felt "moved" to teach a new faith, which should dispense with idolatry on the one, as with Judaism and Christianity on the other hand. He was 40 years of age, as we said, when he received the first "divine" communication in the solitude of the mountain Hirâ, near Mecca. Gabriel appeared to him, and in the name of God commanded him to "read" —that is, to preach the true religion, and to spread it abroad by committing it to writing (Sur. xcvi.). How far Mohammed was a "prophet," in the common sense of the word, has been the subject of endless and utterly futile discussions in the Christian world. That he was no vulgar impostor is now as generally recognized as that other once popular doctrine, that he was in league with the devil, is rejected by thinking men. What part his epilepsy had in his "visions," we are not able to determine. Certain it is that, after long and painful solitary broodings, a something—not clearly known to himself—at times moved him with such fearfully rapturous vehemence that, during his revelations, he is said to have roared like a camel, and to have streamed with perspiration; his eyes turned red, and the foam stood before his mouth. The voices he heard were sometimes those of a bell, sometimes of a man, sometimes they came in his dreams, or they were laid in his heart. Waraka, one of his wife's relatives, who had embraced Judaism, spoke to him of the Jewish doctrine, and told him the story of the patriarchs and Israel; not so much as it is told in the Bible, but in the Midrash; and the gorgeous hues of the legendary poetry of the latter seem to have made as deep an impression on Mohammed's poetical mind as the doctrine of the unity of God and the *morale*—in its broad outlines —of the Old Testament, together with those civil and religious laws, scriptural and oral, which are either contained as germs or fully developed in this record. Christianity exercised a minor influence upon him and his spiritual offspring. All his knowledge of the New Testament was confined to a few apocryphal books, and with all the deep reverence before Jesus, whom, together with Moses, he calls the greatest prophet, next to himself, his notions of the Christian religion and its founder were excessively vague. For some details on these points, however, we must refer to KORAN and MOHAMMEDANISM.

His first revelation he communicated to no one, it would appear, except to Chadidja, to his daughters, his step-son Ali, his favorite slave Zaid—whom he had probably freed and adopted by this time—and to his friend, the prudent and honest Abu Bekr. His other relatives rejected his teachings with scorn. Abu Lahab, his uncle, called him a fool; and Abu Talib, his adoptive father, although he never ceased, for the honor of his family, to protect him, yet never professed any belief in Mohammed's words. In the fourth year of his mission, however, he had made 40 proselytes, chiefly slaves and people from the lower ranks; and now first some verses were revealed to him, commanding him to come forward publicly as a preacher, and to defy the scorn of the unbelievers. With all his power he now inveighed against the primeval superstition of the Meccans, and exhorted them to a pious and moral life, and to the belief in an all-mighty, all-wise, everlasting, indivisible, all-just, but merciful God, who had chosen him as he had chosen the prophets of the Bible before him, so to teach mankind that they should escape the punishments of hell, and inherit everlasting life. God's mercy—this was a primitive doctrine, common to the whole east—was principally to be obtained by prayer, fasting, and almsgiving. The belief in the sacredness of the Kaaba and the ceremonies of the pilgrimage was too firmly rooted in his and the people's minds not to be received into the new creed; but certain barbarous habits of the Bedouins, such as the killing of their new-born daughters, were ruthlessly condemned by Mohammed. The prohibition of certain kinds of food also belongs to this first period, when he as yet entirely stood under the influence of Judaism; the prohibition of gambling, usury, etc., probably being of a somewhat later date. Whether he did or did not understand the art of writing and reading at the commencement of his career, is not quite clear; certain it is that he pretended not to know it, and employed the services of amanuenses for his Koranic dicta, which at first consisted merely of brief, rhymed sentences, in the manner of the ancient Arabic soothsayers. [KORAN.] The Meccans did not object to his doings; they considered him a common "poet" or "soothsayer," who, moreover, was not in his right senses, or simply a liar. Gradually, however, as the number of his converts increased, they began to pay more and more attention to his proceedings; and finally, fearing mostly for the sacredness of Mecca, which the new doctrine might abolish, thus depriving them of their chief glory and the ample revenues of the pilgrimages, they rose in fierce opposition against the new prophet and his adherents, who dared "to call their ancient gods idols, and their ancestors fools." Many of the converted slaves and freedmen had to undergo terrible punishments; and others suffered so much at the hands of their own relatives that they were fain to revoke their creed; so that the prophet himself advised his followers to emigrate to Abyssinia. Mohammed himself, although protected by the strong arm of Abu Talib, was yet at that time so low-spirited and fearful, that he even raised the idols, which hitherto he had represented as nought, to intermediate beings between God and man—a dictum, however, which he soon revoked as an inspiration of Satan, thereby increasing the hatred of his adversaries, at whose head stood two members of the family of Machzûm, Al-Walid and Abulhakam Amr (called by Mohammed "Father of Foolishness"), and who in every way tried to throw ridicule on him. At last it became necessary that he should be put beyond the reach of his persecutors, and Abu Talib hid him in a fortified castle of his own in the country. Hamza, his uncle, and Omar, formerly a bitter enemy of Mohammed, and who afterwards, with Mohammed and Abu Bekr, became the third head of Islam, continued in the meantime to spread the new doctrine. The Koreish now demanded that Mohammed should be delivered into their hands; but Abu Talib steadfastly refused to comply with their wishes; a feud thereupon broke out between their family and that of the Hashemites, and Mohammed and all the members of his family, except, perhaps, Abu Lahab, were excommunicated. After the space of three years, however, the "peace party" in Mecca brought about a reconciliation, and Mohammed was allowed to return. A great grief befell him at this time—his faithful wife Chadidja died, and, shortly afterwards, his uncle Abu Talib, and, to add to his misery, the vicissitudes of his career had reduced him by this time to poverty. An emigration to Taïf, where he sought to improve his position, proved a failure; it was with great difficulty that he escaped with his bare life. During this epoch he had the well-known dream of his journey to Jerusalem and in the heavens on the back of the Borak (Miraj), the relation of which caused even his stanchest adherents to smile at his hallucination. Shortly after his return from Taïf he married Sauda, and afterwards so increased the number of his wives that at his death he still left nine, of whom Ayishah, the daughter of Abu Bekr, and Hafsa, the daughter of Omar, are best known. In the midst of his vain endeavors to find a hearing in his own city, and those near it, he succeeded, during a pilgrimage, in converting several men from Medina, whose inhabitants had long been accustomed to hear from the mouths of the numerous Jews living in the city and its neighborhood the words Revelation, Prophecy, God's Word, Messiah: to the Meccans mere sounds without any meaning. The seed sown into the minds of these men bore a fruitful harvest. The next pilgrimage brought 12, and the third more than 70 adherents to the new faith from Medina, and with these he entered into a close alliance. Mohammed now conceived the plan to seek refuge in the friendly city of Medina, and about 622 (10, 13, or 15 years—according to the different traditions—after his first assuming the sacred office) he fled thither, about 100 families of his faithful flock having preceded him some time before, accompanied by Abu Bekr, and reached, not without danger, the town, called thence Medinat Annabi (city of the prophet), or Medina "City," by way of eminence; and from this flight, or rather from the first month of the next Arabic year, dates the Mohammedan era [Hedjrah]. Now everything was changed to the advantage of the prophet and his religion; and if formerly the incidents of his life are shrouded in comparative obscurity, they are, from this date, known often to their most insignificant details. Formerly a despised "madman or impostor," he now assumed at once the position of highest judge, lawgiver, and ruler of the city and two most powerful Arabic tribes. His first care was directed towards the consolidation of the new worship, and the inner arrangements in the congregation of his flock; his next chief endeavor was to proselytize the numerous Jews who inhabited the city, to whom, besides having received their principal dogmas into his religion, he made many important concessions also in the outer observances of Islam, and concluded alliances with many of their tribes; but he was sorely disappointed in his hopes to convert them. They ridiculed his pretension to be the Messiah, and so enraged him by their constant taunts that he soon abrogated his concessions, and became their bitterest adversary up to the hour of his death. The most important act in the first year of the Hegira was his permission to go to war with the enemies of Islam in the name of God—a kind of manifesto chiefly directed against the Meccans. Not being able at first to fight his enemies in open field, he endeavored to weaken their power by attacking the caravans of the Koreish on their way to Syria. Being successful enough to disturb their trade, and, at the same time, to conclude alliances with the adjoining Bedouin tribes, he at last dared to break even the peace of the sacred month of Radjab, and with this the signal to open warfare was given. A battle, the first, between 814 Moslems and about 600 Meccans was fought at Badr, in the second year of the Hegira; the former gained the victory, and made many prisoners. A great number of adventurers now flocked to Mohammed's colors, and he successfully continued his expeditions against the Koreish and the Jewish tribes, chiefly the Beni Keinukâ, whose fortified castles he took after a long siege. Notwithstanding a severe loss which he suffered in the battle near Ohod, in which he himself was dangerously wounded, his power increased so rapidly that in the sixth year of the Hegira already he was able to proclaim a public pilgrimage to Mecca. Although the Meccans did not allow this to be carried out, he gained the still greater advantage that they concluded a formal peace with him, and thus recognized him as an equal power and belligerent. He was now allowed to send his missionaries all over Arabia, and even beyond the frontiers, without any hindrance; and in the following year he had the satisfaction of celebrating the pilgrimage for three days undisturbed at Mecca. Shortly afterwards, during his expeditions against the Jews of Chaibar and Fadak, Mohammed very nearly lost his life: a Jewess, Zainab by name, a relative of whom had fallen in the fight against him, placed a poisoned piece of roast meat before him, and although he merely tasted it, he yet, up to his death, suffered from the effects of the poison. His missionaries at this time began to carry his doctrines abroad, to Chosroes II., to Heraclius, to the king of Abyssinia, the viceroy of Egypt, and the chiefs of several Arabic provinces. Some received the new gospel; but Chosrû Parvis, the king of Persia, and Amru the Ghassanide, rejected his proposals with scorn, and the latter had the messenger executed. This was the cause of the first war between the Christians and the Moslems, in which the latter were beaten with great loss by Amru. The Meccans now thought the long-desired moment of revenge at hand, and broke the peace by committing several acts of violence against the Chuzaites, the allies of Mohammed. The latter, however, marched at the head of 10,000 men against Mecca, before its inhabitants had had time to prepare for the siege, took it, and was publicly recognized by them as chief and prophet. With this the victory of the new religion was secured in Arabia. While, however, employed in destroying all traces of idoltary in the besieged city, and fixing the minor laws and ceremonies of the true faith, Mohammed heard of new armies which several warlike Arabic tribes marched against him, and which were concentrated near Taïf (630). Again he was victorious, and his dominion and creed extended further and further every day. From all parts flocked the deputations to do homage to him in the name of the various tribes, either as the messenger of God, or at least as the prince of Arabia, and the year 8 of the Hegira was therefore called the year of the deputations. Once more he made most extensive preparations for a war against the Byzantines; but not being able to bring together a sufficient army, he had to be satisfied with the homage of a few minor princes on his way to the frontiers, and to return without having carried out his intention. Towards the end of the 10th year of the Hegira he undertook, at the head of at least 40,000 Moslems, his last solemn pilgrimage to Mecca, and there (on the mount Arafat) instructed them in all the important laws and ordinances, chiefly of the pilgrimage; and the ceremonies observed by him on that occasion were fixed for all times. (Hajj.) He again solemnly exhorted his believers to righteousness and piety, and chiefly recommended them to protect the weak, the poor, and the women, and to abstain from usury.

Returned from Mecca, he occupied himself again with the carrying out of his expedition against Syria, but fell dangerously ill very soon after his return. One night, while suffering from an attack of fever, he went to the cemetery of Medina, and prayed and wept upon the tombs, praising the dead, and wishing that he himself might soon be delivered from the storms of this world. For a few more days he went about; at last, too weak further to visit his wives, he chose the house of Ayeshah, situated near a mosque, as his abode during his sickness. He continued to take part in the public prayers as long as he could; until at last, feeling that his hour had come, he once more preached to the people, recommending Abu Bekr and Usma, the son of Zaid, as the generals whom he had chosen for the army. He then asked, like Moses, whether he had wronged any one, and read to them passages from the Koran, preparing the minds of his hearers for his death, and exhorting them to peace among themselves, and to strict obedience to the tenets of the faith. A few days afterwards, he asked for writing materials, probably in order to fix a successor to his office as chief of the faithful; but Omar, fearing he might chose Ali, while he himself inclined to Abu Bekr, would not allow him to be furnished with them. In his last wanderings he only spoke of angels and heaven. He died in the lap of Ayeshah, about noon of Monday the 12th (11th) of the third month, in the year 11 of the Hegira (8th of June, 632). His death caused an immense excitement and distress among the faithful, and Omar, who himself would not believe in it, tried to persuade the people of his still being alive. But Abu Bekr said to the assembled multitude: "Whoever among you has served Mohammed, let him know that Mohammed is dead; but he who has served the God of Mohammed, let him continue in his service, for he is still alive, and never dies." While his corpse was yet unburied, the quarrels about his successor, whom he had not definitively been able to appoint, commenced; and finally Abu Bekr received the homage of the principal Moslems at Medina. Mohammed was then buried in the night from the 9th to the 10th of June, after long discussions, in the house of Ayeshah, where he had died, and which afterwards became part of the adjoining mosque.

This, in briefest outline, is Mohammed's career. We have not been able to dwell, as we could have wished to do, with any length, either on the peculiar circumstances of his inner life, which preceded and accompanied his "prophetic" course, nor on the part which idolatry, Judaism, Christianity, and his own reflection respectively, bore in the formation of his religion; nor have we been able to trace the process by which his "mission" grew upon him, as it were, and he, from a simple admonisher of his family, became the founder of a faith to which now above 130,000,000 are said to adhere. The articles KORAN and MOHAMMEDANISM contain some further details on his doctrine and its history. We have, in addition to the few observations on the points indicated at the beginning, only to reiterate that a man of Mohammed's extraordinary powers and gifts is not to be judged by a modern commonplace standard; and that the manners and morals of his own time and country must also be taken into consideration. We are far from overrating his character. He was at times deceitful, cunning, even revengeful and cowardly; and generally addicted beyond limit to sensuality. But all this does not justify the savage and silly abuse which has been heaped upon his name for centuries by ignorance and fanaticism. Not only his public station as prophet, preacher, and prince, but also his private character, his amiability, his faithfulness toward friends, his tenderness toward his family, and the frequent readiness to forgive an enemy, besides the extreme simplicity of his domestic life (he lived, when already in full power, in a miserable hut, mended his own clothes, and freed all his slaves), must be taken into consideration; and to do him full justice, his melancholic temperament, his nervousness, often bordering on frenzy, and which brought him to the brink of suicide, and his being a poet of the highest order, with all the weaknesses of a poet developed to excess, must not be forgotten. Altogether, his mind contained the strangest mixture of right and wrong, of truth and error. Although his self-chosen mission was the abolition of superstition, he yet believed in Jins, omens, charms, and dreams, and this is an additional reason against the, as we said, now generally abandoned notion that he was a vulgar designer, who by no means deceived himself about those revelations which he pretended to have received. And however much the religion of Islam may, rightly or wrongly, be considered the bane and prime cause of the rottenness of eastern states and nations in our day, it must, in the first place, not be forgotten that it is not necessarily Islam which has caused the corruption, as indeed its ethics are for the most part of the highest order; and in the second place, that Mohammed is not to be made responsible for all the errors of his successors Take him all in all, the history of humanity has seen few more earnest, noble, and sincere "prophets"—using the word prophet in the broad human sense of one irresistibly impelled by an inner power to admonish, and to teach, and to utter austere and sublime truths, the full purport of which is often unknown to himself.

The most important European biographies of Mohammed are those of Sprenger, Weil, Muir, Nöldeke, Reinaud. See also KORAN, MOHAMMEDANISM, SUNNA.

MOHAMMED, the name of four sultans of Turkey, of whom the most noted is MOHAMMED II., surnamed *Bujuk* or THE GREAT, the conqueror of Constantinople. He was born at Adrianople in 1430, and succeeded his father Amurath II., in 1450. His first acts were the murder of his two brothers, and the suppression of a rebellion in Karaman. Having thus secured himself on the throne, he bent all his energies to the accomplishment of the great project which had always been kept prominently in view by his predecessors—the capture of Constantinople. This city was now the sole remnant of the once mighty empire of the Cæsars; and after more than a year spent in preparations, Mohammed commenced the siege April 6, 1453, with an army of 258,000 men, and a fleet of 320 vessels. The Greeks, aided by a gallant band of 2,000 strangers, under Gian

Justiniani, a noble Genoese, long maintained an obstinate resistance. On the morning of May 29, a combined attack was made by land and sea without success; but the retirement from the ramparts of Justiniani, who had been severely wounded, and despaired of a successful defense, caused a panic among his followers, and the simultaneous charge of a chosen body of janizaries, with Mahommed himself at their head, was irresistible. Constantine III. died in the breach, and the Turks poured in over his corpse to plunder and devastate his capital. Mohammed now transferred the seat of his government to Constantinople, and sought to win back the inhabitants by promising them the free exercise of their religion. He next reduced the kingdoms of Morea and Trebizond, offshoots of the Greek empire, obtained possession of Servia on the death of its last prince, and made formidable preparations for the invasion of Hungary. Belgrade was the first point of attack; and with 100,000 men, supported by a fleet of 200 ships on the Danube, Mohammed sat down before its walls. The enormous ordnance which had done such good service at Constantinople, were employed to batter the ramparts; but the valor, skill, and activity of the defenders foiled his utmost efforts. John Hunyady (q.v.), who, with 5,000 chosen troops, had re-enforced the garrison, destroyed or captured all his vessels, and soon after, by a sudden sally, defeated his army, and carried off the battering-train, compelling him to raise the siege, Aug. 6, 1456. His next enterprise was the invasion of Epirus, where Scanderberg had hitherto successfully defied the sultan's power. Three Turkish armies were destroyed in rapid succession, and a fourth and fifth under Mohammed himself met with no greater success; but the death of the gallant Epirote, in 1467, removed the only obstacle to the success of the sultan's plans, and Epirus was forthwith annexed to Turkey. The latter half of Mohammed's reign was also fruitful in important achievements, but our space will permit only a cursory notice of them. He reduced the khan of the Crimea to the condition of a vassal, deprived the Genoese of Caffa, and the Venetians of Friuli, Istria, Negropont, and Lemnos; but the knights of St. John repelled him from Rhodes, and the Venetians from Scodra. He carried his arms into Italy, and took Otranto, but died in 1481 at Nicomedia, while on the way to join his son Bajazet, who was warring with the Persians and Egyptians. His frequent contests with the former of these nations had always interfered very much with the successful prosecution of his designs of conquest in Europe. Mohammed was possessed of great abilities; he was brave, enterprising, and sagacious; nor was he deficient in learning, for he spoke four languages fluently, was well versed in geography, ancient history, and the natural sciences, and was practically acquainted with the fine arts. But the brilliancy of his career, and the occasional generosity and even magnanimity which he showed, cannot obliterate the recollection of those acts of cruelty and treachery which have justly branded him as the most ruthless tyrant of the house of Osman. As the founder of the Turkish power in Europe, his memory has always been revered by the Turks.

MOHAMMED IV., 1642–92; b. Turkey; succeeded his father, Ibrahim I., in 1648. He possessed little capacity for power, and spent most of his time in the chase. He was fortunate in having as successive grand viziers two men of extraordinary talents—the Albanian Mohammed Kuprili or Kuperli, and his son, Ahmed Kuprili. Mohammed Kuprili promptly quelled the disturbances which prevailed throughout the empire at Ibrahim's death, and carried on the war with Venice which had been begun by Ibrahim. The Turkish fleet was defeated by the Venetians in the archipelago in 1651, and, five years later, another Turkish fleet was completely destroyed by them. In 1657 the Turks retook Lemnos and Tenedos. In 1660 war was declared with Austria; the Turkish army, after a successful campaign in Hungary, was at length badly defeated in 1664 by the combined forces of France, Italy, and Germany. In 1661 Ahmed Kuprili succeeded his father as vizier, and continued the war with Venice. He laid siege to the city of Candia in 1667, and forced it to surrender in 1669. A treaty of peace was negotiated between the two states at once. In 1672 Mohammed IV. put himself at the head of the army and invaded Poland, but was badly defeated the next year by John Sobieski, and in 1676 Poland was granted a treaty of peace. In 1682 Turkey declared war against Austria upon the occasion of a revolt in Hungary, and in 1683 Kara Mustapha, with an army of 300,000 men, laid siege to Vienna. The imperial army had fled from the city, which was on the point of capitulating, when it was relieved by an army under Charles of Lorraine and John Sobieski, who defeated the Turks, whose position grew every day more precarious. Another alliance was formed against them between Venice, Germany, Russia, and Poland. In 1687 Charles of Lorraine defeated the Turkish army, which suffered heavy losses, at Mohacs, and soon after Transylvania and other Danubian provinces fell away from Turkey. Late in 1687 a mutiny broke out in the Turkish army before Belgrade; the troops marched upon Constantinople, deprived Mohammed IV. of his throne, and made his brother sultan as Solyman III. Mohammed IV. was imprisoned during the rest of his life.

MOHAM'MEDANISM, the religion founded by Mohammed, or, according to him, the only orthodox creed existing from the beginning of the world, and preached by all the prophets ever since Adam. It is also called *Islám*, resignation, entire submission to the will and precepts of God. In its exclusively dogmatical or theoretical part, it is *Imán*, faith; in its practical, *Dîn*, religion (by way of eminence). The fundamental principles of the former are contained in the two articles of belief: "There is no God but God; and Mohammed is God's apostle." The Mohammedan docrine of God's nature and attributes coincides with the Christian, in so far as he is by both taught to be the Creator of all things in heaven and earth, who rules and preserves all things, without beginning, omnipotent, omniscient, omnipresent, and full of mercy. Yet, according to the Mohammedan belief, he has no offspring: "He begetteth not, nor is he begotten." Nor is Jesus called anything but a prophet and apostle, although his birth is said to have been due to a miraculous divine operation; and as the Koran superseded the Gospel, so Mohammed, Christ. The crucifixion is said to have been executed upon another person, Christ having been taken up unto God before the decree was carried out. He will come again upon the earth, to establish everywhere the Moslem religion, and to be a sign of the coming of the day of judgment. Next to the belief in God, that in angels forms a prominent dogma. Created of fire, and endowed with a kind of uncorporeal body, they stand between God and man, adoring or waiting upon the former, or interceding for and guarding the latter. The four chief angels are "The Holy Spirit," or "Angel of Revelation"—Gabriel; the special protector and guardian of the Jews—Michael; the "Angel of Death"—Azraël (Raphael, in the apocryphal gospel of Barnabas); and Israfîl—Uriel, whose office it will be to sound the trumpet at the resurrection. It will hardly be necessary, after what we said under MOHAMMED, to point out, in every individual instance, how most of his "religious" notions were taken almost bodily from the Jewish legends; his angelology, however, the Jews had borrowed themselves from the Persians, only altering the names, and, in a few cases, the offices of the chief angelic dignitaries. Besides angels, there are good and evil genii, the chief of the latter being Iblis (despair), once called Azazil, who, refusing to pay homage to Adam, was rejected by God. These Jin are of a grosser fabric than angels, and subject to death. They, too, have different names and offices (Peri, fairies; Div, giants; Takvîns, fates, etc.), and are, in almost every respect, like the Shêdim in the Talmud and Midrash. A further point of belief is that in certain God-given scriptures, revealed successively to the different prophets. Four only of the original 104 sacred books: viz., the Pentateuch, the Psalms, the Gospel, and the Koran, are said to have survived; the three former, however, in a mutilated and falsified condition. Besides these, a certain apocryphal gospel, attributed to St. Barnabas, and the writings of Daniel, together with those of a few other prophets, are taken notice of by the Moslems, but not as canonical books. The number of prophets, sent at various times, is stated variously at between 200,000 and 300,000, among whom 313 were apostles, and six were specially commissioned to proclaim new laws and dispensations, which abrogated the preceding ones. These were Adam, Noah, Abraham, Moses, Jesus, and Mohammed—the last the greatest of them all, and the propagator of the final dispensation. The belief in the resurrection and the final judgment is the next article of faith. The dead are received in their graves by an angel announcing the coming of the two examiners, Monker and Nakir, who put questions to the corpse respecting his belief in God and Mohammed, and who, in accordance with the answers, either torture or comfort him. This again is the Jewish "Chibbut hakkeber," the beating of the grave, a hyperbolical description of the sufferings during the intermediate state after death (purgatory). The soul, awaiting the general resurrection, enters according to its rank, either immediately into paradise (prophets), or partakes, in the shape of a green bird, of the delights of the abode of bliss (martyrs), or—in the case of common believers—is supposed either to stay near the grave, or to be with Adam in the lowest heaven, or to remain either in the well of Zem-Zem, or in the trumpet of the resurrection. According to others, it rests in the shape of a white bird under the throne of God. The souls of the infidels dwell in a certain well in the province of Hadramaut (Heb. Chambers of Death), or, being first offered to heaven, then offered to earth, and rejected by either, subject to unspeakable tortures until the day of resurrection. Concerning the latter, great discrepancy reigns among the Mohammedan theologians. Mohammed himself seems to have held that both soul and body will be raised, and the "Bone Luz" of the Jewish Haggadah was by him transformed into the bone Al Ajb, the rump-bone, which will remain uncorrupted till the last day, and from which the whole body will spring anew, after a forty days' rain. Among the signs by which the approach of the last day may be known—nearly all taken from the legendary part of the Talmud and Midrash, where the signs of the coming of the Messiah are enumerated—are the decay of faith among men, the advancing of the meanest persons to highest dignities, wars, seditions, and tumults, and consequent dire distress, so that a man, passing another's grave, shall say: "Would to God I were in his place!" Certain provinces shall revolt, and the buildings of Medina shall reach to Yahâb. Again: the sun will rise in the west, the Beast will appear, Constantinople will be taken by the descendants of Isaac, the Antichrist will come and be killed by Jesus at Lud. There will further take place, a war with the Jews, Gog and Magog's (Jajug and Majuj's) eruption, a great smoke, an eclipse, the Mohammedans will return to idolatry, a great treasure will be found in the Euphrates, the Kaaba will be destroyed by the Ethiopians, beasts and inanimate things will speak, and finally, a wind will sweep away the souls of those who have faith, even if equal only to a grain of mustard seed, so that the world shall be left in ignorance. The time of the resurrection even Mohammed could not learn from Gabriel: it is a mystery. Three blasts will announce it: that of consternation, of such terrible powers that mothers shall neglect the babes on their breasts, and that heaven and earth will melt; that of examination, which will annihilate all things and beings, even the angel of death, save paradise and hell, and their inhabitants; and forty years later, that of resurrection, when all men, Mohammed first, shall have their souls breathed into their restored bodies, and will sleep in their sepulchers until the final doom has been passed upon them. The day of judgment, lasting from one to fifty thousand years, will call up angels, genii, men, and animals. The trial over, the righteous will enter paradise, to the right hand, and the wicked will pass to the left, into hell; both, however, have first to go over the bridge Al Sirât, laid over the midst of hell, and finer than a hair, and sharper than the edge of a sword, and beset with thorns on either side. The righteous will proceed on their path with ease and swiftness, but the wicked will fall down headlong to hell below—a place divided into seven stories or apartments, respectively assigned to Mohammedans, Jews, Christians, Sabians, Magians, idolaters, and—the lowest of all—to the hypocrites, who, outwardly professing a religion, in reality had none. The degrees of pain—chiefly consisting in intense heat and cold—vary; but the Mohammedans, and all those who professed the unity of God, will finally be released, while unbelievers and idolaters will be condemned to eternal punishment. Paradise is divided from hell by a partition (Orf), in which a certain number of half-saints will find place. The blessed, destined for the abodes of eternal delight (Jannat Aden, Heb. Gan Eden)—of which it is, however, not quite certain whether it is created already—will first drink of the pond of the prophet, which is supplied from the rivers of paradise, whiter than milk, and more odoriferous than musk. Arrived at one of the eight gates, they will be met by beautiful youths and angels; and their degree of righteousness (prophets, religious teachers, martyrs, believers) will procure for them the corresponding degree of happiness. It may, however, not be superfluous to add that, according to the Mohammedan doctrine, it is not a person's good works or merits which gain his admittance, but solely God's mercy; also, that the poor will enter paradise five hundred years before the rich; and that the majority of the inhabitants of hell are women. As to the various felicities which await the pious (and of which there are about a hundred degrees), they are a wild conglomeration of Jewish, Christian, Magian, and other fancies on the subject, to which the prophet's own exceedingly sensual imagination has added very considerably. Feasting in the most gorgeous and delicious variety, the most costly and brilliant garments, odors, and music of the most ravishing nature, and above all, the enjoyment of the Hûr Al Oyûn, the black-eyed daughters of paradise, created of pure musk, and free from all the bodily weaknesses of the female sex, are held out as a reward to the commonest inhabitants of paradise, who will always remain in the full vigor of their youth and manhood.[*] For those deserving a higher degree of recompense, rewards will be prepared, of a purely spiritual kind—i.e., the "beholding of God's face" (Shechinah) by night and by day. A separate abode of happiness will also be reserved for women, but there is considerable doubt as to the manner of their enjoyment. That they are not of a prominently spiritual nature is clear from the story of the prophet and the old woman. The latter solicited Mohammed to intercede with God that she might be admitted into paradise, whereupon he replied that old women were not allowed in paradise, which dictum—causing her to weep—he further explained by saying that they would first be made young again. The last of the precepts of pure faith taught by Mohammedanism, is the full and unconditional submission to God's decree [ISLAM], and the predestination of good and evil, which is found, from the beginning, inscribed on a "preserved table." Not only a man's fortunes, but his deeds, and, consequently, his future reward or punishment, are irrevocably, and thus unavoidably, pre-ordained (fate): a doctrine which is not, however, taken literally by *all* Moslems, but which has no doubt contributed largely to the success of Islam, by inspiring its champions with the greatest indifference and contempt for the dangers of warfare; their destiny being immutably fixed, under any circumstances.

Thus far, briefly, the Iman, dogmatical or theoretical part of Islam. The Din, or practical part, which contains the ritual and moral laws, inculcates as the chief duties the following four: prayer, alms-giving, fasting, and pilgrimage.

Prayer, "the key of paradise," comprises also certain religious purifications, as the most necessary preparations to the former. They are of two kinds: the *Ghusl*, or total immersion of the body, required as a religious ceremony, on some special occasions; and the *Wudû*, a partial ablution, to be performed immediately before the prayer. This is of primary importance, and consists of the washing of hands, face, ears, and feet up to the ankles—a proceeding generally accompanied at each stage by corresponding pious sentences, and concluded by the recital of the 97th chapter of the Koran. In the case of water being beyond reach, dry dust or sand may supply its place. "The practice of religion being founded on cleanliness," it is not sufficient that the believer himself should be purified, but even the ground or the carpet upon which he prays must be as clean as possible, and the use of a special prayer-carpet (Seggadéh) is therefore recommended. Every Mohammedan is obliged to pray five times in the space of every twenty-four hours. The prayer (Salah) itself consists partly of extracts from the revealed book, the Koran (Fard), partly of pieces ordained by the prophet without allegation of a divine order (Sunnah). The first time of prayer commences at the Maghrib, or about sunset; the second, at the Eshë, or nightfall; the third, at the Subh, or daybreak; the fourth, at the Duhr, or about noon; the fifth, at the Asr, or afternoon. The believers are not to commence their prayers exactly at sunrise, or noon, or sunset, lest they might be confounded with the infidel sun-worshipers. These several times of prayer are announced by the Mueddins (q.v.) from the minarets or madnehs of the mosques. Their chant, sung to a very simple but solemn melody, sounds harmoniously and sonorously down the height of the mosque, through the midday din and roar of the cities, but its impression is one of the most strikingly poetical in the stillness of night; so much so, that even many Europeans cannot help congratulating the prophet on his preferring the human voice to either the Jewish trumpet-call of the time of the Temple, or the Christian church-bells. The day-call (the Adan) consists chiefly of the confession of faith (God is most great—Mohammed is God's apostle—come to prayer, come to security) repeated several times; the night-calls (Ula, the first; Ebed, the second), destined for persons who desire to perform supererogatory acts of devotion, are much longer. The believer often changes his posture during his prayers; and a certain number of such inclinations of head and knees, prostrations, etc., is called a Rekah. It is also necessary that the face of the worshiper should be turned toward the Kibleh, in the direction of Mecca (q.v.), the exterior wall of the mosque marking that direction being distinguished by a niche (Mehrab). All sumptuous and pompous apparel is laid aside before the believer approaches the sacred place; and the extreme solemnity and decorum, the unaffected humility, the real and all-absorbing devotion which pervades it, have been unanimously held up as an example to other creeds. Women, although not strictly forbidden to enter the mosque, yet are not practically allowed to pray there, lest their presence might be hurtful to true devotion. Besides these prayers, there are others ordained for special occasions, as on a pilgrimage, before a battle, at funerals, during an eclipse, etc. That the Moslems do not pray *to* Mohammed, but simply implore his intercession, as they do that of the numerous saints, the relatives of the prophet, and the first propagators of Islam, need, after what we said under MOHAMMED, not be dwelt upon here. For the particulars of the service in the mosque, the reader is referred to that heading. It may be remarked in passing, that Mohammedanism has no clergy in our sense of the word, the civil and religious law being bound up in one. See also MOLLAH, MUFTI.

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[*] "The whole earth will be as one loaf of bread, which God will reach to them like a cake; for meat they will have the ox Balâm and the fish Nûn, the lobes of whose livers will suffice seventy thousand men. Every believer will have eighty thousand servants, and seventy-two girls of paradise, besides his own former wives, if he should wish for these, and a large tent of pearls, jacinths, and emeralds: three hundred dishes of gold shall be set before each guest at once, and the last morsel will be as grateful as the first. Wine will be permitted, and will flow copiously, without inebriating. The righteous will be clothed in the most precious silks and gold, and will be crowned with crowns of the most resplendent pearls and jewels. If they desire children, they shall beget them, and see them grow up within an hour. Besides the ravishing songs of the angel Israfil and the daughters of paradise, the very trees will, by the rustling of their boughs, the clanging of bells suspended from them, and the clashing of their fruits, which are pearls and emeralds, make sweetest music."

Next in importance stands the duty of giving alms. These are twofold—legal (Zekah) and voluntary (Sadakah; Heb. Zedakah, piety, righteousness); but the former, once collected by the sovereign, and applied to pious uses, has now been practically abrogated. The Sadakah is, according to the law, to be given once every year, of cattle, money, corn, fruits, and wares sold, at about the rate of from two and a half up to twenty per cent. Besides these, it is usual to bestow a measure of provisions upon the poor, at the end of the sacred month of Ramadán.

The duty of fasting follows. [FASTS.] During the whole month of Ramadán, the Moslem is commanded to refrain from eating, drinking, smoking, smelling perfumes, bathing, and every unnecessary indulgence in worldly pleasure, from daybreak until sunset. From that period till the morning, he is allowed to eat, drink, and enjoy himself. The Arabian years being lunar, it often happens that the Ramadán falls in midsummer, when the fasting, more especially the abstaining from drinking, is excessively mortifying. None are exempt from this duty save the sick, travelers, and soldiers in time of war; but they are bound to fast an equal number of days during some other months. Nurses and pregnant women are entirely free from fasting. It is Mohammed's special and express desire that no one should fast who is not quite equal to it, lest he might injure his health, and disqualify himself for necessary labor. Of the other commendable fast-days, the Ashura, on the 10th of Moharram (the Jewish Jom Kippur), deserves special mention. There are very few Moslems who do not keep the Ramadán, even if they neglect their other religious duties; at all events, they all pretend to keep it most strictly, fasting being considered "one-fourth part of the faith," nay, "the gate of religion."

Of the fourth paramount duty of the Mohammedan—viz., the pilgrimage to Mecca—we have spoken both under that heading, and, more fully, in the article HAJJ. Suffice it here briefly to recapitulate that the Kaaba (q.v.) is to be encompassed seven times, the celebrated black stone being kissed at each round, that Mount Arafat is to be visited, the sacrifice El-Fida (the Ransom, in memory of Ismael's sacrifice) to be performed, and a number of minor ceremonies to be gone through by the pilgrim, and that he who neglects to perform the sacred pilgrimage, "might as well die a Jew or a Christian."

To the "positive" ordinances of Islam may also be reckoned the "Saghir," or minor, and "Kebir," or great festivals. [FESTIVALS.] The first Al-Fetr, or breaking the fast), following immediately upon the Ramadán, begins on the first day of the month of Shawâl, and lasts three days. The second (Eed Al-Kurban, or sacrifice) begins on the 10th of Dsu'l Heggeh, when the pilgrims perform their sacrifice, and lasts three or four days. Yet, although intended to be the more important of the two, the people have in most places changed the order, and, by way of compensation for the previous fast, they make the lesser festival which follows the Ramadán the more joyful and the longer of the two. The day set aside for the weekly day of rest is the Friday—not, as is generally supposed, because both the Jewish Sabbath and the Christian Sunday were to be avoided, but because, from times long before Mohammed, the people used to hold public assemblies for civil as well as religious purposes on that day. The celebration of the Moslem days of religious solemnity is far less strict than is the custom with the other Shemitic religions. Service being over, the people are allowed to return to their worldly affairs, if they cannot afford to give themselves up entirely to pleasure or devotion for the rest of the sacred period.

Thus far, briefly, the principal positive laws of Islam relating to faith and practice. We shall now touch upon the fundamental prohibitory laws contained in the Koran.

First of all, the drinking of wine, which includes all strong and inebriating liquors, as giving rise to "more evil than good," is rigorously forbidden; and although of late, chiefly through European influence, very many Moslems have lost their religious scruples on that score, and not only secretly but openly indulge in spirits, yet the great bulk of the faithful refuse even to make use of the proceeds of the sale of wine or grapes. Some over-scrupulous believers even include opium, coffee, and tobacco in the prohibition; but general practice has decided differently. The prohibitory laws respecting food resemble closely those of Judaism: blood, the flesh of swine, further, animals which have died from disease or age, or on which the name of some idol has been invoked, or which have been sacrificed unto an idol, or which have been strangled, or killed by a blow, a fall, or by some other beast, are strictly forbidden. "Pure" animals must be slaughtered according to certain fixed rules, and the name of God is to be invoked before the operation, without, however, the usual addition of the benevolent epithets, since these would ill befit the sufferings of a fellow-creature. Fish, birds, game are mostly allowed for food, yet there are in nearly all cases certain religious ceremonies to be observed, before they become fit for the believer's table.

All games subject to chance ("casting lots by arrows")—such as dice, cards, tables, bets, etc.—are considered so wicked, that a gambler's testimony is invalid in a court of law. (The Talmud only rejects the testimony of the habituul "*dice-* [Kubia, i.e., Cube] *gambler* and *better upon doves.*") Chess and other games depending on skill—provided they do not interfere with the regular performance of religious duties, and that they are played without any stakes whatsoever—are allowed by the majority of Moslem theologians. Usury is strictly prohibited. Taking interest upon any loan, however large or small, or profiting in trade through any questionable means, save by buying and selling, is severely condemned.

To prevent the faithful from ever falling back into idolatry, the laws relating to images and pictures have been made very stringent. Whosoever makes an imitation of any living being in stone, wood, or any other material, shall, on the day of judgment, be asked to endow his creation with life and soul, and, on his protesting his inability of doing so, shall undergo the punishment of hell for a certain period.

The civil and criminal laws of Mohammedanism, founded both on the Koran and the Traditions (*Sunna*), are, in some instances, where the letter of the written or oral precept allows of various explanations, or where the case in question is not foreseen, interpreted according to the opinion of one of the four great masters of Islam: Abu Hanífa, Malec Ibn Ans, Shâfeï, Ibn Hanbal, within the pale of their respective sects. The principal points, however, upon which all Mohammedans agree are the following: Polygamy is allowed, not, as is commonly supposed, without any restriction, but: "Take in marriage of the women who please you, two, three, or four; but if ye fear that ye cannot act equitably, one; or those whom your right hands have acquired"—i.e., your slaves. These are the explicit words of the Koran (iv. 3), so that four wives, and a certain number of concubine slaves, is the whole extent to which a Moslem may legally go. The prophet's example proves nothing to the contrary, since he was endowed with special privileges, and not subject to the common law in many respects. It is, moreover, added, as an advice, that to marry one or two is quite sufficient for a man, if he apprehend any inconvenience from a larger number of wives. A Moslem may, if urged by excessive love, or if unable to obtain a wife of his own creed, marry a Christian woman or a Jewess, but a Mohammedan woman is not, under any circumstances, to marry an unbeliever. In all cases, however, the child born of a Moslem, whatever the mother's faith, is a Moslem; nor does the wife, who is an unbeliever, inherit at her husband's death. Forbidden degrees are: the mother, daughter, sister, half-sister, aunt, niece, foster-mother, or a woman related to the faithful "by milk in any of the degrees which would preclude his marriage with her, if she were similarly related to him by consanguinity;" the mother of his wife, even if he be not properly married to the latter yet; the daughter of his wife, if the latter still be his legal wife; his father's wife and his son's wife; or two sisters at the same time; or wives who stand to each other in the relation of aunt and niece; or the unemancipated slave, or another man's slave, if he have already a free wife. A simple declaration of a man and woman at the age of puberty, before two witnesses, of their intention to marry each other, and the payment of part of the dowry (which is indispensable, and must amount to at least ten dirhems, or about five shillings), is sufficient for a legal marriage. A girl under age is given away by her natural or appointed guardian, with or without her consent. To see the face of any woman who is neither his wife nor his concubine, nor belongs to any of the forbidden degrees, is strictly forbidden to the believer.

Divorce is a comparatively light matter with the Mohammedans. Twice, a man may send away his wife and take her back again without any ceremony; the third time, however—if he unite the triple divorce in one sentence at once—he dare not receive her again in wedlock until she have been married properly to another man in the meantime. Mere dislike is sufficient reason for a man to dissolve the conjugal ties, and his saying: "Thou art divorced," or "I divorce thee," together with the payment of part of the wife's dowry, is all that is required from him by the law. A wife, on the other hand, is bound to her husband forever, unless she can prove some flagrant ill-usage or neglect of conjugal duty on his part; and even then, she forfeits part, or the whole, of her dowry. A divorced woman is obliged to wait, like a widow, for a certain period before marrying again: if pregnant, until delivery; three months, or four months and ten days, according to circumstances. If she have a young child, she is to suckle it until it be two years old, and the father is to bear all the expenses of the maintenance of mother and child. A woman proving disobedient to her husband, may be declared by the kadi "náshizeh," i.e. rebellious, and the husband is no longer bound to maintain her. Yet, he cannot be forced to divorce her under these circumstances, so that the woman is generally in so sore a plight that she is obliged to promise good behavior for the future, and the husband has then either to take her back to his house, or to set her free by a formal divorce. On the other hand, it often happens that a woman prefers a mere separation, to continuing to live with her husband; in which case she gets herself, of her own accord, inscribed a "náshizeh." If a slave becomes a mother by her master, and he acknowledges the child to be his own, the latter is free, and the mother is to be emancipated at the master's death, and may not be given away, or otherwise disposed of by him, during his lifetime. A free person, wishing to marry his or her slave, must first emancipate this slave; and if the slave of another person has been married by a free man or woman, and afterward becomes the latter's property, the marriage becomes illegal, and can only be renewed by a legal contract and emancipation.

The privilege of primogeniture does not exist in the Mohammedan law, but males generally receive a double share. A person may not bequeath more than one-third of his property, unless there be no legal heirs. Children, whether begotten with the legal wife, or slave, or concubine, or only adopted, and their descendants, are the first heirs; next come the claims of wives, parents, brothers, sisters, in their order. Where there is no legal heir, the property falls to the crown.

The law is very lenient toward debtors, the Koran recommending the creditor to remit a debt "as alms." Insolvency and inability to work for the discharge of the claim, solve all further obligations. The most conscientious performance of all private contracts, however, is constantly recommended in the Koran.

Murder is either punished with death, or by the payment of a fine to the family of the deceased, according to their own pleasure. There must, however, be palliating circumstances in the latter case. The Bedouins, however, have expanded the law of blood-revenge in a terrible manner, and up to this day the "vendetta" often rages not only between family and family, but between whole tribes, villages, and provinces. Unintentional homicide is expiated by freeing a believer from slavery, and paying to the family a certain sum in proportion to the rank and sex of the deceased. He who has not the means of freeing a believer, is to fast for two months by way of penance. According to the strict letter of the law, a man is not liable to capital punishment for killing his own child or an infidel; but, practically, no difference is generally made by the Mohammedan governments (chiefly the Turkish) in our day. Murder is punished with death, and no fine frees the culprit.

The Mosaic law of retaliation, in case of *intentional* wounds and mutilation, holds good also for Islam; that is (not, as has ignorantly been supposed, that the corresponding limb of the offender is to be cut off), a certain proportionate fine in money is to be paid to the injured. The payment for any of the single limbs of the human body—e.g. the nose—is the full price of blood, as for a homicide; for a limb which is found twice, like hand or foot, half; for a finger or toe, the tenth part, etc. Women and slaves have smaller claims. Injuries of a dangerous, or otherwise grievous nature, pay the full price; those of an inferior kind, however, bring the perpetrator within the province of the lash or cudgel, which is supposed to have "come down from heaven, to be used by the judge for the promotion of virtue and duty."

The Koran orders theft—of no less than the value of half a crown—to be punished by cutting off the chief offending limb: the right hand; the second theft is punishable by the loss of the left foot; the third, of the left hand; the fourth, of the right foot, etc.; but the ordinary punishments of imprisonment, hard labor, and the bastinado, have been substituted in our days. The property stolen must not, however, have been of easy access to the thief, nor must it have consisted of food, since he may have taken this to satisfy the craving of his hunger.

Unchastity on the part of a woman was, in the commencement of Islam, punished by imprisonment for life, for which afterward, however, stoning was substituted in the case of a married woman; and a hundred stripes and a year's exile in the case of an unmarried free woman; a slave to undergo only half of that punishment. Yet, it is necessary that he who accuses a "woman of reputation" of adultery or fornication, shall produce four (male) witnesses, and if he be not able to do so, he is to receive fourscore stripes, nor is his testimony ever after to be received, for he is considered an "infamous prevaricator"—unless he swear four times that he speaks the truth, and the fifth time imprecate God's vengeance if he speak false. Yet, even this testimony may be overthrown by the wife's swearing four times that he is a liar, and imprecating the fifth time the wrath of God upon herself, if he speak the truth. In the latter case, she is free from punishment; the marriage, however, is to be dissolved. Fornication in either sex is, by the law of the Koran, to be visited with a hundred stripes,

Infidelity, or apostacy from Islam, is a crime to be visited by the death of the offender, if he have been warned thrice without recanting. Severer still, that is, not to be averted by repentance or revocation of any kind, is the punishment inflicted for blasphemy—against God, Mohammed, Christ, Moses, or any other prophet. Instantaneous death is the doom of the offender; for if apostacy may be caused by error and misguidance, "blasphemy is the sign of complete wickedness and thorough corruption of the soul."

A further injunction of the Koran, for the carrying out of which, however, the time has well-nigh gone by, is that of making war against the infidels. He who is slain while fighting in defense and for the propagation of Islam, is reckoned a martyr; while a deserter from the holy war is held up as an object of execration, and has forfeited his life in this world as well as in the world to come. At first, all the enemies taken in battle were ruthlessly slain; later, however, it became the law to give the people of a different faith against whom war was declared the choice of three things: either to embrace Islam—in which case they became Moslems at once, free in their persons and fortunes, and entitled to all the privileges of Moslems; or to submit to pay tribute—in which case they were allowed to continue in their religion, if it did not imply gross idolatry or otherwise offended against the moral law; or to decide the quarrel by the fortune of war —in which case the captive women and children were made slaves, and the men either slain, unless they became converts at the last moment, or otherwise disposed of by the prince. The fifth part of the spoil belongs "to God," that is, the sanctuary (Kaaba, etc.), to the apostle and his kindred, to the orphans, the poor, and the traveler.

We need hardly urge that the Koran is not a systematically arranged code, and that all the laws and regulations hitherto enumerated, although contained in it, either bodily or, as it were, in germs—further developed by the Sunna (q.v.)—are to a great extent only mentioned in an incidental manner, thrown together and mixed up, often in the strangest manner, with the most heterogeneous dicta, dogmas, moral exhortations, civil and criminal laws, etc., and are principally to be considered as supplementary to the existing laws and regulations which they either abrogated, confirmed, or extended, according to the pressing demand of circumstances during the prophet's life. In cases for which subsequent ages found no written rules laid down by the prophet, traditional oral dicta were taken as the norm, and later still, precedents of the caliphs were binding, Hence contradictions in theory and practice have crept in, according to the different traditions and decisions of the imams or expounders of the law, besides the various interpretations put upon the book itself within the pale of the different Mohammedan sects. The secular tribunals, therefore, not unfrequently differ in their decisions from the judicial tribunals; and the distinction between the written civil law of the ecclesiastical courts and the common law, aided by the executive power, is, fortunately for the cause of human culture and the spread of civilization, getting clearer and clearer every day.

That part of Islam, however, which has undergone (because not to be circumscribed and defined by doctors) the least changes in the course of time, and which most distinctly reveals the mind of its author, is also its most complete and its most shining part—we mean the ethics of the Koran. They are not found, any more than the other laws, brought together in one, or two, or three Surahs, but "like golden threads" they are woven into the huge fabric of the religious constitution of Mohammed. Injustice, falsehood, pride, revengefulness, calumny, mockery, avarice, prodigality, debauchery, mistrust, and suspicion are inveighed against as ungodly and wicked; while benevolence, liberality, modesty, forbearance, patience and endurance, frugality, sincerity, straightforwardness, decency, love of peace and truth, and above all, trusting in God and submitting to his will, are considered as the pillars of true piety, and the principal signs of a true believer. Nor must we omit to point out expressly that Mohammed never laid down that doctrine of absolute predestination and "fatality" which destroys all human will and freedom, since the individual's deeds cannot alter one iota in his destiny either in this world or in the next. So far from it, foolhardiness is distinctly prohibited in the Koran (ii. 196). Caution is recommended. Prayer, the highest ceremonial law of Islam, is modified in case of danger. It is legal to earn one's livelihood on Friday after prayer, and to shorten the readings in the Koran for the sake of attending to business. All of which is enough to show that the Moslem is not to expect to be fed pursuant to a divine decree whether he be idle or not. On the other hand, a glance at the whole system of faith, built on hope and fear, rewards and punishments, paradise and hell, both to be man's portion according to his acts in this life, and the incessant exhortations to virtue, and denunciations of vice, are sufficient to prove that aboriginal predestination, such as St. Augustine taught it, is not in the Koran, where only submission to the Lord's will, hope during misfortune, modesty in prosperity, and entire confidence in the divine plans, are supported by the argument, that everything is in the hands of the highest being, and that there is no appeal against his absolute decrees.

And this is one instance of the way in which most of Mohammed's dicta have been developed and explained—both by sectarians and enemies within and without Islam—in such a manner that he has often been made to teach the very reverse of what he really did teach; and thus monstrosities now found in his creed, if carefully traced back to their original sources, will, in most cases, be seen to be the growth of later generations, or the very things he abrogated. That, again, the worst side of his character, the often wanton cruelty with which he pursued his great mission, the propagation of his faith, should by his successors have been taken as a thing to be principally imitated, is not to be wondered at, considering how brilliant the results of the policy of the bloody sword had proved. Scarcely a century had elapsed after Mohammed's death, and Islam reigned supreme over Arabia, Syria, Persia, Egypt, the whole of the northern coast of Africa, even as far as Spain; and notwithstanding the subsequent strifes and divisions in the interior of this gigantic realm, it grew and grew outwardly, until the crescent was made to gleam from the spires of St. Sophia at Constantinople, and the war-cry "Allah il Allah!" resounded before the gates of Vienna. From that time, however, the splendor and the power of Mohammedanism began to wane. Although there are counted about 130 millions this day all over the globe who profess Islam, and although it is, especially at this present juncture, making great progress among the African races, yet the number of real and thorough believers is infinitely small; and since it has left off conquering, it has lost also that energy and elasticity which promises great things. Its future fate will depend chiefly, we should say, on the progress of European conquest in the east, and the amount of western civilization which it will, for good or evil, import into those parts.

We cannot consider in this place what Islam has done for the cause of all humanity, or, more exactly, what was its precise share in the development of science and art in Europe. We refer to the special articles which treat of these subjects, and particularly to the biographies found in the course of this work of men eminent in every branch of human knowledge who have issued from the ranks of Islam. Broadly speaking, the Mohammedans may be said to have been the enlightened teachers of barbarous Europe from the 9th to the 13th century. It is from the glorious days of the Abbaside rulers that the real renaissance of Greek spirit and Greek culture is to be dated. Classical literature would have been irredeemably lost, had it not been for the home it found in the schools of the "unbelievers" of the "dark ages." Arabic philosophy, medicine, natural history, geography, history, grammar, rhetoric, and the "golden art of poetry," schooled by the old Hellenic masters, brought forth an abundant harvest of works, many of which will live and teach as long as there will be generations to be taught.

Besides the Koran, the Sunna, and the native (Arabic, Persian, Turkish, etc.) writers on the foregoing subject, we mention as further references the works of the European scholars Maracci, Hyde, Prideaux, Chardin, Du Ryer, Reland, D'Herbelot, Sale, De Sacy, Hammer, Burckhardt, Sprenger, Burton, Muir, Garcin de Tassy, Lane, Weil, Geiger, Nöldeke. See KORAN, MOHAMMED, SHIITES, SHAFIITES, SUNNA, MOHAMMEDAN SECTS.

MOHAMMEDAN SECTS. "My community," Mohammed is reported to have said, "will separate itself into 73 sects; one only will be saved, all the others shall perish." This prophecy has been largely fulfilled. Even during the illness, and immediately after the death of the founder, many differences of opinion arose among his earliest adherents. We have endeavored to show, both under KORAN and MOHAMMEDANISM, how the fundamental book of Islam left certain points undecided by the very fact of its poetical wording, and how, further, the peculiarity of the Arabic idiom at times allowed many interpretations to be put upon one cardinal and dogmatic sentence. To add to this uncertainty, a vast number of oral traditions sprang up and circulated as an expansive corollary to the Koran. Political causes soon came to assist the confusion and contest, and religion was made the pretext for faction-fights, which in reality had their origin in the ambition of certain men of influence. Thus "sects" increased in far larger numbers even than the prophet had foretold, and though their existence was but short-lived in most instances, they yet deserve attention, were it only as signs and tokens of the ever-fresh life of the human spirit, which, though fettered a thousand times by narrow and hard formulas, will break these fetters as often, and prove its everlasting right to freedom of thought and action.

The bewildering mass of these currents of controversy has by the Arabic historians been brought under four chief heads or fundamental bases. The first of these relates to the divine attributes and unity. Which of these attributes are essential or eternal? Is the omnipotence of God absolute? If not, what are its limits? Further, as to the doctrine of God's predestination and man's liberty—a question of no small purport, and one which has been controverted in nearly all "revealed" religions—How far is God's decree influenced by man's own will? How far can God countenance evil? and questions of a similar kind belonging to this province. The third is perhaps the most comprehensive "basis," and the one that bears most directly upon practical doctrines—viz., the promises and threats, and the names of God, together with various other questions chiefly relating to faith, repentance, infidelity, and error. The fourth is the one that concerns itself with the influence of reason and history upon the transcendental realm of faith. To this chapter belong the mission of prophets, the office of Imam, or head of the church, and such intricate subtleties as to what constitutes goodness and badness; how far actions are to be condemned on the ground of reason or the "law," etc.

One broad line, however, came to be drawn, in the course of time, among these innumerable religious divisions, a line that separated them all into orthodox sects and heterodox sects; orthodox being those only who adopted the oral traditions or Sunna (see SUNNITES).

Much more numerous than the orthodox divisions are the heterodox ones. Immediately after Mohammed's death, and during the early conquests, the contest was chiefly confined to the question of the Imamat. But no sooner were the first days of warfare over, than thinking minds began to direct themselves to a closer examination of the faith itself, for which and through which the world was to be conquered, and to the book which preached it, the Koran. The earliest germs of a religious dissension are found in the revolt of the Kharejites against Ali, in the 37th year of the Hegira; and several doctors shortly afterwards broached heterodox opinions about predestination and the good and evil to be ascribed to God. These new doctrines were boldly, and in a very advanced form, openly preached by Wâsil Ibn Atâ, who, for uttering a moderate opinion in the matter of the "sinner," had been expelled from the rigorous school of Basra. He then formed a school of his own—that of the Separatists or Motazilites (q.v.), who, together with a number of other "heretical" groups, are variously counted as one, four, or seven sects.

We now come to the second great heretic group, the Sefatians. The Sefatians (attributionists) held a precisely contrary view to that of the Motazilites. With them, God's attributes, whether essential or operative, or what they afterwards called declarative or historical, i.e., used in historical narration (eyes, face, hand), anthropomorphisms, in fact, were considered eternal. But here, again, lay the germs for more dissensions and more sects in their own midst. Some taking this notion of God's attributes in a strictly literal sense, assumed a likeness between God and created things; others giving it a more allegorical interpretation, without, however, entering into any particulars beyond the reiterated doctrine, that God had no companion or similitude. The different sects into which they split were, first, the Asharians, so called from Abul Hasan al Ashari, who, at first a Motazilite, disagreed with his masters on the point of God's being bound to do always that which is best. He became the founder of a new school, which held (1) that God's attributes are to be held distinct from his essence, and that any literal understanding of the words that stand for God's limbs in the Koran is reprehensible. (2) That predestination must be taken in its most literal meaning, i.e., that God preordains everything. The opinions on this point of man's free will are, however, much divided, as indeed to combine a predestination which ordains every act with man's free choice is not easy; and the older authors hold it is well not to inquire too minutely into these things, lest all precepts, both positive and negative, be argued away. The middle path, adopted by the greater number of the doctors, is expressed in this formula: There is neither compulsion nor free liberty, but the way lies between the two; the power and will being both created by God, though the merit or guilt be imputed to man. Regarding mortal sin, it was held by this sect that if a believer die guilty of it without repentance, he will not, for all that, always remain a denizen of hell. God will either pardon him, or the prophet will intercede on his behalf, as he says in the Koran: "My intercession shall be employed for those among my people who shall have been guilty of grievous crimes;" and further, that he in whose heart there is faith but of the weight of an ant, shall be delivered from hell-fire. From this more philosophical opinion, however, departed a number of other Sefatian sects, who, taking the Koranic words more literally, transformed God's attributes into grossly corporeal things, like the Mosshabehites, or Assimilators, who conceived God to be a figure composed of limbs like those of created beings, either of a bodily or spiritual nature, capable of local motion, ascent, or descent, etc. The notions of some actually went so far as to declare God to be "hollow from the crown of the head to the breast, and solid from the breast downward; he also had black curled hair." Another subdivision of this sect were the Jabarians, who deny to man all free agency, and make all his deeds dependent on God. Their name indicates their religious tendency sufficiently, meaning "Necessitarians."

The third principal division of "heretical sects" is formed by the Kharejites, or "rebels" from the lawful prince—i.e., Ali—the first of whom were the 12,000 men who fell away from him after having fought under him at the battle of Seffein, taking offense at his submitting the decision of his right to the caliphate (against Moawiyah) to arbitration. Their "heresy" consisted, first, in their holding that any man might be called to the Imamat though he did not belong to the Koreish, nor was even a freeman, provided he was a just and pious man, and fit in every other respect. It also followed that an unrighteous Imam might be deposed, or even put to death; and further, that there was no absolute necessity for any Imam in the world.

Of the fourth principal sect, the Shiites, or "Sectaries," the followers of Ali Ibn Abi Tâleb, we have spoken under that special heading.

It remains only to mention a few of the many pseudo-prophets who arose from time to time in the bosom of Islam, drawing a certain number of adherents around them, and threatening to undermine the church founded by Mohammed, by either declaring themselves his legal successors, or completely renouncing his doctrines. The first, and most prominent among these, was Mosaylima (q.v.). Next to him stands Al-Aswad, originally called Aihala, of the tribe of Ans, of which, as well as of that of a number of other tribes, he was governor. He pretended to receive certain revelations from two angels, Sohaik and Shoraik. Certain feats of legerdemain, and a natural eloquence, procured him a number of followers, by whose aid he made himself master of several provinces. A counter-revolution, however, broke out the night before Mohammed's death, and Al-Aswad's head was cut off; whereby an end was put to a rebellion of exactly four months' duration, but already assuming large proportions. In the same year (11 Hegira), but after Mohammed's death, a man named Toleiha set up as prophet, but with very little success. He, his tribe and followers, were met in open battle by Khalid, at the head of the troops of the faithful, and being beaten, had all finally to submit to Islam.

A few words ought also to be said regarding the "veiled prophet," Al-Mokanna, or Borkai, whose real name was Hakem Ibn Hashem, at the time of Al-Mohdi, the third Abbaside caliph. He used to hide the deformity of his face (he had also but one eye) by a gilded mask, a circumstance which his followers explained by the splendor of his countenance being too brilliant (like that of Moses) to be borne by ordinary mortals. Being a proficient in jugglery besides, which went for the power of working miracles, he soon drew many disciples and followers around him. At last he arrogated the office of the Deity itself, which, by continual transmigrations from Adam downward, had at last resided in the body of Abu Moslem, the governor of Khorassan, whose secretary this new prophet had been. The caliph, finding him growing more and more formidable every day, sent a force against him, which finally drove him back into one of his strongest fortresses, where he first poisoned and then burned all his family; after which he threw himself into the flames, which consumed him completely, except his hair. He had left a message, however, to the effect that he would reappear in the shape of a gray man riding on a gray beast, and many of his followers for many years after expected his reappearance. They wore, as a distinguishing mark, nothing but white garments. He died about the middle of the 2d c. Hegira.

Of the Karmathians and the Ismaïlis, we have spoken under these special headings. We can scarcely enumerate among the prophets Abul Teyeb Ahmed Al-Motanebbi, one of the most celebrated Arabic poets, who mistook, or pretended to mistake, his poetical inspirations for the divine afflatus, and caused several tribes to style him prophet, as his surname indicates, and to acknowledge his mission. The governor of his province, Lûlû, took the promptest steps to stifle any such pretensions in the bud, by imprisoning him, and making him formally renounce all absurd pretensions to a prophetical office. The poet did so with all speed. He was richly rewarded by the court and many princes for his minstrelsy, to which henceforth he clung exclusively; but the riches he thus accumulated became the cause of his death. Robbers attacked him while he was returning to his home in Kufa, there to live upon the treasure bestowed upon him by Ada-do'ddawla, sultan of Persia.—The last of these new prophets to be mentioned is Baba, who appeared in Amasia, in Natolia, in 638 Hegira, and who had immense success, chiefly with the Turkmâns, his own nation, so that at last he found himself at the head of nearly a million men, horse and foot. Their war-cry was, God is God, and Baba—not Mohammed—is his prophet. It was not until both Christians and Mohammedans combined for the purpose of self-defense, that this new and most formidable power was annihilated, its armies being routed and put to the sword, while the two chiefs were decapitated by the executioner.

MOHA'VE, a co. in n.w. Arizona, having the navigable Rio Colorado for its w. boundary, separating it from California, and the Bill Williams river and Santa Maria creek for its s. boundary; about 6,500 sq.m.; pop. '76, 822. Its surface is mountainous, largely covered with timber, and with broad valleys varying from 2 to 10 m. in width. Its soil is for the most part unproductive, but the river banks are susceptible of cultivation, bearing now a wild growth of cottonwood, mezquite, and the nutritious grass that furnishes good pasturage. It contains the celebrated cañon of the Colorado, a stupendous chasm with rocky walls from 3,000 to 6,000 ft. high extending for 300 miles. Gold, copper, and lead are found; and it has rich silver mines and quartz mills. Its trade is principally in miners' supplies. Capital, Mineral Park.

MOHA'VE DESERT, a valley in s. California lying principally in s. Bernadino county. It is a desert only in name, as large parts of it afford good pasturage, and water is easily procurable in wells, though the streams in the valley are small, and do not flow into the ocean. In some portions the summer heat is intense, and vegetation is scanty. Much of the district is said to be below the level of the sea. Mohave river, in s. Bernardino co., California, flows e.n.e., and is lost in the Mohave desert.

MOHA'VES, the name of a tribe of Indians who occupy lands along the Colorado and Mohave rivers, in Arizona. They belong to a nation of the Pima family—the Yumas—and are naturally a brave and warlike race, though not quarrelsome. They favor agriculture as a pursuit more than most of the tribes, and some of them are semi-civilized in their manner of living, occupying decently constructed dwellings. About 1000 of them dwell on a reservation appointed by the U. S. government, comprising about 130,000 acres. The remainder, twice or three times as many, are scattered. They are rapidly diminishing in numbers through the influence of disease. No attempt is being made to educate them, nor are there any missions among them.

MO'HAWK, a river of New York, named from a tribe of Indians. It rises in Oneida county, 20 m. n. of Rome, and runs e.s.e. into the Hudson at Waterford, 10 m. above Albany. It is 135 m. long, and has numerous and picturesque waterfalls, especially at Little Falls, Cohoes, and Waterford, affording abundant water-power. In its populous valley are the Erie canal and New York Central railway.

MOHAWKS. See AGMEGUE.

MOHICANS, MOHEGANS, or MAHICANNI, once a powerful and warlike sub-tribe of North American Indians, of the great Algonquin family, which, in the 17th c., inhabited the territory n.n.w. of Long Island sound, and e. of the river Hudson, now included in the states of New York, Connecticut. and Massachusetts. Being compelled to give way to the conquering Iroquois confederacy, they retired to the valley of the Housatonic river in Connecticut, and were consequently one of the first tribes who came into collision with, and were dispossessed of their territory by the early British settlers. They subsequently lived dispersed among the other tribes, and all traces of them have now nearly disappeared. Their name has become widely known through Mr. J. Fenimore Cooper's celebrated novel, *The Last of the Mohicans.*

MOHI'LEV, or MOGILEV, a government of European Russia, lying between Minsk and Smolensk, contains 18,500 English sq.m., with a pop. (1870) of 947,625. The inhabitants are mostly Rusniaks, though there are also many Russians, Germans, Jews, and even Bohemians. The country is generally a plain, with here and there an occasional undulation; the soil is very fertile, and the climate most agreeably mild. Agriculture has here reached a high degree of perfection, and the same may be said of arboriculture and horticulture. The natural pasturage is of fine quality, and affords abundant nourishment to immense herds of cattle. The forests are extensive. The country is watered by the Dnieper and its numerous affluents, which form the means of communication with the Black sea ports, and of the transit of corn, timber, and masts, of which last large quantities are annually floated down to Kherson. Bog iron-ore is found in abundance. The inhabitants are celebrated for their activity and industry; and Mohilev, from its great natural advantages, has now become one of the richest provinces of Russia.

In early times, Mohilev belonged to the territory of the Russian prince of Smolensk, but was subsequently conquered by the grand duke of Lithuania, and was, along with Lithuania, united to the kingdom of Poland. In 1772 it was seized by Russia at the first partition of Poland; and in 1796 was joined to the government of Vitebsk, under the name of *White Russia;* but since 1802 it has formed a separate government.

MOHILEV, or MOGILEV, the capital of the government of the same name in European Russia, and one of the finest towns of Russia, is situated in the center of the government, on the right bank of the Dnieper, 100 m. s.w. of Smolensk. It is the seat of a Greek archbishop, and of the Roman Catholic primate of Russia and Poland, besides being the favorite residence of many of the Russian nobility. It possesses a fine Greek cathedral, built in 1780, 20 Greek, 1 Lutheran, and 4 Roman Catholic churches, several synagogues, and a variety of religious, educational, and charitable institutions. Its streets are wide, straight, and well paved, and there is a fine promenade bordered with trees, whence a beautiful view of the valley of the Dnieper is obtained. Pop. '67, 38,922, of whom one-third are Jews. There is a large export trade to the chief ports of the Baltic and Black seas.

MOHILEV, or MOGILOW, a district town on the s.w. frontier of the government of Podolia, European Russia, is situated on the left bank of the Dniester, 50 m. e. by s. from Kaminetz. Pop. '67, 9,756. It carries on an active trade with the adjacent Russian provinces, and with the Turkish principalities of Moldavia and Wallachia. The climate is so mild, that silk and other products of warm climates are extensively produced.

MOHL, HUGO, VON, 1805-72, b. Stuttgart; studied medicine and natural sciences at Tübingen, and was professor of botany and director of the botanic garden in Tübingen in 1835. His works were numerous, and he is of high authority on vegetable physiology.

MOHL, JULIUS VON, b. at Stuttgart, 1800; studied Persian and Chinese at Tübingen, Paris, London, and Oxford; was professor of oriental literature in Tübingen, 1826–32; went to Paris and became professor of Persian at the college de France in 1845, and in 1852 director of the oriental department of the national printing-office. His principal work is his edition of Firdusi's *Shah Nameh*, and many Chinese and other oriental works. He published also *Dante et les origines de la littérature italienne.*

MÖHLER, JOHANN ADAM, one of the most distinguished modern polemical divines of the Roman Catholic church, was b. of humble parentage at Igersheim, in Würtemberg, May 6, 1796. He received his early education at the gymnasium of Mergentheim, whence, in his 17th year, he was transferred, for the higher studies, to the lyceum of Ellwangen; and soon afterward entered upon the theological course in the university of Tübingen. He received priest's orders in 1819, and for a short time was employed in missionary duty; but, in 1820, he returned to college life, for two years was engaged as classical tutor; but, in 1822, the offer of a theological appointment in the university of Tübingen finally decided his choice of the study of divinity. He was permitted, before entering on his studies, to spend some time in making himself acquainted with the routine of the theological courses of other universities—as Göttingen, Berlin, Prague, Vienna, and Landshut; and in 1823 he entered upon his new position. In 1828, in which year he was also admitted to the degree of doctor of divinity, he was appointed ordinary professor of theology. His earliest publication was a treatise *On the Unity of the Church* (1825), which was followed, in 1827, by a historico-theological essay on *Athanasius and the Church of his Time, in Conflict with Arianism.* But his reputation, both posthumous and among his own contemporaries, rests mainly on his well-known *Symbolism; or the Doctrinal Differences between Catholics and Protestants, as represented by their Public Confessions of Faith* (1832). This remarkable book at once fixed the attention of the theological world. It passed through five large editions in six years. It was translated into all the leading languages of Europe, and drew forth numerous criticisms and rejoinders, the most considerable of which is that of Dr. F. C. Baur (q.v.), 1833. To this Möhler replied in 1834, by a work entitled *Further Researches into the Doctrinal Differences of Catholics and Protestants.* The polemical bitterness evoked by these controversies made it desirable that Möhler should leave the university of Tübingen. He was invited to Breslau, and also to Bonn, but ultimately selected (1835) the university of Munich, then in the first flush of its efficiency, under king Louis. His first appointment was nominally the chair of biblical exegesis, but he really devoted himself to the department of church history, in which his opening course was eminently successful; but, unhappily, a naturally delicate constitution began to give way under the constant fatigues of a student's life; and although he continued, under all these disadvantages, to maintain and to add to his reputation, and although, in 1837, the invitation to the Bonn professorship was renewed in still more flattering terms, he gradually sunk under consumption, and died April 12, 1838. His miscellaneous works were collected and published posthumously, in 2 vols. 8vo (1839–40), by his friend, the now celebrated Dr. Döllinger. Möhler may be regarded as at once the most acute and the most philosophical of the modern controversialists of his church. He deals more, however, with the exposition of the points and the grounds of the doctrinal differences of modern sects, than with the discussion of the scriptural or traditional evidences of the peculiar doctrines of any among them.

MO'IDORE, a former gold coin of Portugal, of the value of 4,800 reis, or nearly 27s. sterling. It was also called *lisbonine.*

MOIGNO (DE VILLEBEAU), FRANÇOIS NAPOLÉON MARIE, 1804; b. in Morbihan, France; educated in Jesuit schools and colleges; was made abbé in 1830. In 1836 his advancement in mathematical studies gave him a professorship in Paris. He afterwards contributed articles on religious subjects to the *Univers* and other church journals, and in 1840 published *Leçons de Calcul Diferential et Intégral.* In 1845 he became the scientific editor of *L'Époque;* in 1849 and 1850 traveled and contributed to the *Presse* and *Pays*, and in 1852 became editor-in-chief of the *Cosmos*, a scientific weekly in Paris. His reputation as a man of great learning both as a linguist and scientist is based on a large number of published works. Among them is one designed to harmonize state with religious instruction, entitled *Principes Fondamentaux d'apres laquels Doivent se Résondre les deux Grandes Questions des Rapports de l'Église et de l'État et de l'Organization de l'Enseignement*, etc., published in 1846 in Paris.

MOIR, DAVID MACBETH, 1798–1851; b. at Musselburgh, Scotland; was educated at the grammar school, and at the age of 13 was apprenticed for four years to Dr. Stewart, a medical practitioner. At the close of his apprenticeship he finished his course at Edinburgh, and received his diploma as surgeon in 1816. Towards the close of his college course he sent forth an anonymous publication entitled *The Bombardment of Algiers and other Poems.* In 1812 he appeared in print with two short essays in prose in a local magazine. Returning home he devoted himself to literature. In 1817 he joined Dr. Brown as a partner in an extensive medical practice in Musselburgh. His evenings and nights he spent in literary study. Having previously contributed in prose and verse to the *Scot's Magazine* and to Constable's *Edinburgh Magazine*, he became a constant contributor in prose and verse to *Blackwood's Magazine*, which was started about that time. His verse was both comic and serious. Among his clever comic effusions were *The Eve of St. Jerry* and *The Auncient Waggonere.* His serious poems had the signature Δ, from which he obtained the literary cognomen of *Delta.* His connection with *Blackwood* continued till his death. In 1823 he formed a strong friendship for John Galt, the novelist, who, being suddenly called off to America before finishing his novel *The Last of the Lairds*, commissioned Moir to write the concluding chapters for him. In 1824 he published the *The Legend of Genevieve and other Tales and Poems*, comprising selections from his magazine articles, with some original additions. In 1824 he began in *Blackwood* his novel of *The Autobiography of Mansie Wauch*, which was continued for nearly three years, and published in a volume. Though urged to remove to the metropolis, where he would have a more lucrative practice and a larger circle of literary friends, he preferred the scenes of his early days and his practice among the poor. His practice was so extensive that for ten successive years he never slept a night out of Musselburgh. In 1829 he published *Outlines of the Ancient History of Medicine, being a View of the Healing Art among the Egyptians, Greeks, Romans, and Arabians.* In 1832 he greatly exerted himself to check the cholera, and published, as secretary of the board of health, *Practical Observations on Malignant Cholera*, and *Proofs of the Contagion of Malignant Cholera.* In 1843 he published *Domestic Verses*, in which he records with tenderness the loss of his two sons. In 1846 he was thrown from a carriage and rendered lame for life. In 1851 he delivered a course of six lectures on the poetical literature of the past half century at the Edinburgh philosophical institution, which were afterwards published. In the same year he published *Selim*, his last contribution to *Blackwood's Magazine.* His contributions to *Blackwood* alone number 370. The poems of Moir are graceful and pathetic. A selection of his poetical works in two volumes was published by Thomas Aird with a memoir of the author.

MOIRA, Earl of. See Hastings, Francis Rawdon.

MOIRE, the French name (formerly *mohère*, and supposed to be taken from the Eng. *mohair*, which is itself probably of eastern origin) applied to silks figured by the peculiar process called watering. The silks for this purpose must be broad and of a good substantial make; thin and narrow pieces will not do: they are wetted and then folded with particular care to insure the threads of the fabric lying all in the same direction, and not crossing each other except as in the usual way of the web and the warp. The folded pieces of silk are then submitted to an enormous pressure, generally in a hydraulic machine. By this pressure the air is slowly expelled, and in escaping draws the moisture into curious waved lines, which leave the permanent marking called watering. The finest kinds of watered silks are known as moirés antiques.—The same process has been applied to woolen fabrics called moreen, which is only an alteration of the word moire.

MOIREE METALLIQUE, a French term applied to tin-plate upon which a peculiar figuring like that caused by frost on windows is produced by dipping plates, in a heated state, into nitro-muriatic acid, and then washing with water to remove the acid. When dry the plates are varnished or lacquered, and have a pretty effect. The cheapness and ease of the process have made it very common for inferior articles in tin.

MOISSAC, a t. of France, in the department of Tarn-et-Garonne, on the river Tarn, 15 m. n.w. of Montauban. The church of St. Pierre dates from the year 1100, and contains some excellent carvings and curious fantastic sculptures. Moissac is the center of an important trade in grain. Pop. '76, 5,675.

MOKAN'NA, or Atha-Ben-Hakem. See Mohammedan Sects, *ante.*

MO'LA, a city and sea-port of the Italian province of Bari, delightfully situated among gardens and olive groves on the Adriatic, 13 m. from Bari. It contains fine churches and other edifices, and excellent streets. From all accounts it seems to have exceedingly little trade of any kind. Pop. 12,181.

MOLASSE'. See Mollasse, *ante.*

MOLAS'SES. See Sugar.

MOLAY, Jacques de, 1244–1314; b. Burgundy; of the families of Longvic and Raon. Nothing is known of his early life but that he was admitted to the order of knights templars at Baune, in the diocese of Autun, and was promoted to be grandmaster about 1298. This was in the reign of Philip IV., who was endeavoring to replace the feudal system in France by a powerful monarchy, and who viewed with fear and distrust the growing influence of the knights templars. The success which had characterized the crusades, and which had been largely the work of this and the other Christian orders, had now deserted them. Syria had again fallen a prey to the Mohammedans, and the knights templars and hospitalers had retired to Cyprus, whence they sent forth a cry for help to the Catholic hierarchy and the Christian powers throughout

Europe. But Europe was itself torn by the dissensions of petty potentates. De Molay, however, determined to effect by strategy what he could not control by force; and taking advantage of the movement of the Mogul Tartars against Syria and Egypt, ingratiated himself with the grand khan, and actually received command of one wing of his army, with which he invaded Syria in the spring of 1299. With the troops under his control he recovered Jerusalem from the infidels, and so awakened enthusiasm that a new crusade was urged upon the pope and the kings of France and England. But the unexpected success which had been achieved by Tartar aid was short-lived. In the following year the army of the grand khan was destroyed and Jerusalem again lost to the Christians. The templars returned to the island of Tortosa near Tripoli, with Jacques de Molay still at their head. They were attacked and defeated in 1302, and obliged to flee to Cyprus. It was now that Philip IV. undertook to carry out the project which he had formed to destroy the order whose supremacy he feared. The order was at this time powerful, well-organized—comprising most of the great nobles of Europe—and wealthy to a degree to excite the cupidity of so greedy a monarch as Philip. In the grasp of a mind so broad and a temperament so energetic as those of De Molay, its possible future might well occasion dread to the ambitious and envious. With a design to impose upon the credulity of De Molay, Philip pretended to be anxious for a new crusade, and at his instigation Clement V. called the grand-masters of the templars and hospitalers to Europe. The call was answered by De Molay, among the rest, who appeared in Paris in Aug., 1306, accompanied by a chosen band of distinguished knights of the order, and loaded with treasure. He made a triumphal entry into the capital, a fact which did not tend to allay the suspicions or alter the determination of the king, though he received his visitors with due hospitality. Repairing to Poictiers to render his allegiance to the pope, De Molay took the opportunity to ask an investigation of sinister rumors which had been spread abroad by the enemies of the order. The pope, under the influence of Philip, directed that such an investigation should be undertaken; when the latter, assuming the order to be permission for active proceedings against the order, procured the arrest of every templar in France, and Oct. 13, 1307, Jacques de Molay was seized in the house of the temple and summoned before the inquisition. Although the pope was indignant at this liberty on the part of Philip, and took action to suspend the power of the inquisition in the premises, the king persisted in his determination, and in May, 1310, caused 54 of the templars to be burned at the stake. De Molay was now put under examination by a papal commission, and was condemned to death. He was dragged to the stake, loaded with fetters, "a feeble old man, bent and whitened by age and captivity," and died protesting to the end the innocence of the order—of which he was the last grand-master.

MOLD (anciently *Monte Alto;* Welsh, *Wyddgrug*), a parliamentary borough in the county of Flint, situated on the Alun, 12 m. w.s.w. of Chester. Though Flint is the county town, the assizes and quarter-sessions for the county are held here. The town possesses a good market, a fine old church, and several dissenting chapels. It is connected with England by a branch of the Chester and Holyhead railway. The neighborhood abounds with mineral wealth, coal and lead being the principal produce; it has also numerous interesting relics of antiquity—e. g., so-called Druidic circles, Roman roads and encampments, Saxon earthworks, an eminence called *Bryn Beili* (formerly surmounted by a castle), and a castellated building known as the tower of Rheinallt ab Gruffydd, the two latter having been scenes of frequent contentions between the English and Welsh. Many old families have mansions in the neighborhood, whose pleasing variety of scenery renders it attractive. Pop. of parliamentary borough (1871), 4,534.

MOLDAU (Bohemian, *Vltava*), the chief river of Bohemia, and an important tributary of the Elbe, rises in the Böhmerwald mountains, on the s.w. frontier, at an elevation of 3,750 ft. above the level of the sea, and flows s.e, to Hohenfurth, where it bends northward, and pursues that direction to its confluence with the Elbe opposite Melnik, after a course of 276 miles. Its course to the point of confluence is longer than that of the Elbe, and the navigation of that river is greatly facilitated by the body of water which it contributes. It receives on the left, the Wotawa and the Beraun; and on the right, the Luschnitz and the Sazawa. The chief towns on its banks are Krumau, Budweis, and Prague. It becomes navigable from Budweis.

MOLDA'VIA and **WALLA'CHIA**, two states forming the so-called *Danubian Principalities*, which, since Dec. 23, 1861, have been united under one prince and one administration, and officially bear the single name of Roumania or Rumania. Formerly subject to the Porte, Roumania proclaimed its own absolute independence in 1877, and had its claim recognized at the Berlin Congress of 1878. Reliable statistics as to the Dobrudscha (q.v.), then granted to Roumania in return for Roumanian Bessarabia (q.v.), ceded to Russia, are not yet forthcoming.

1. Moldavia (Ger. *Moldau*, Turk. *Bogdan*) is bounded on the n. and e. by Russia, on the s. by Wallachia, and on the w. by Hungary. Area, since the cession of Bessarabia, about 15,000 sq. miles. The country forms, geographically, part of the great plain of south Russia, except towards the w., where there are spurs from the Carpathians. It is watered by the Pruth, the Sereth, and the Danube, and is almost everywhere fertile, pro-

ducing considerable quantities of grain, fruit, and wine. But the riches of the country consist mainly in its cattle and horses, of which immense numbers are reared on its splendid and far-stretching pastures; swine and sheep are also numerous; and the rearing of bees, owing to the multitude of lime-trees, is extensively carried on. The great plagues of the land are locusts and earthquakes. Minerals and precious metals are said to be abundant, but they have not as yet been worked. There are only a few salt-pits near Okna, in the Carpathian mountains. Trade is almost exclusively in the hands of the numerous Jews, Germans, Greeks, and Russians who have settled in the country. The capital of Moldavia is Jassy (q.v.); but the great center of trade is Galacz (q.v.), where, of late, several British merchants have established houses. The principal exports are grain, wool, lambs' skins, hides, feathers, maize, tar, tallow, honey, leeches, cattle, and salt (in blocks); the imports are chiefly the manufactured products of western Europe. Moldavia is divided into 13 districts, each of which has a prefect or governor, a receiver-general of taxes, and a civil tribunal consisting of a president and two other judges.

2. **Wallachia**, the larger of the united Danubian principalities, is bounded on the n. by the Austrian empire and Moldavia, on the e. and s. by the Danube, and on the w. by the Austrian empire and the Danube. Length from the western frontier to cape Kaliakra on the Black sea, 305 m.; greatest breadth, 130 m.; area, 27,500 sq.miles. The greater part of Wallachia is quite flat; but in the n., where it borders on Hungary and Transylvania, it gradually rises up into a great mountain-wall, impassable save in five places. It is destitute of wood throughout almost its whole extent; and especially along the banks of the Danube, is covered with marshy swamps, miles upon miles in breadth. The principal river flowing *through* the country is the Aluta, which joins the Danube at Nikopol. The climate is extreme: the summer heats are intense; while in winter, the land lies under deep snow for four months. The principal products are corn, maize, millet, wine, flax, tobacco, and olive-oil. The vast treeless heaths afford sustenance to great herds of cattle, sheep, and horses. As in Moldavia, agriculture is an important branch of industry; and the swampy districts of the south are haunted by immense numbers of wild water-fowl. In minerals—especially gold, silver, copper, and rock-salt—the soil is rich, but only the last of these is extensively worked. Bucharest is the capital of Wallachia and of Roumania. The pop. of Roumania, though the loss of Bessarabia was not balanced by the gain of the Dobrudscha, was still estimated in 1878 at near 5 millions.

Administration.—The ruler of the principalities—styled by the Roumans *domnu* or *domnitor;* officially called by the sublime porte *woiwod* (prince); by the Turks generally, *ijauer-effendi* (lord of the unbelievers); and by the Russians, *hospodar* or *gospodarj* (prince)—receives his investiture from the sultan, but is otherwise independent. By the treaty of Paris (1856) and the convention (1858), Moldavia and Wallachia were politically united under one prince, with a special ministry for each country, two elective assemblies, and a central commission, which had its seat at Fokshani. But in Nov., 1861, the sultan sanctioned the admistrative union of the two states; and in the following month it was publicly proclaimed at Bucharest and Jassy. The first ruler of Roumania, prince Alexander John Couza, was forced to abdicate in 1866, when Karl I., son of the prince of Hohenzollern-Sigmaringen, was chosen his successor. At the same time a new and more popular constitution was adopted by a constitutent assembly elected by universal suffrage. The legislative power is vested in two houses, a senate and a chamber of deputies. The former consists of 76 and the latter of 157 members, of whom 82 are for Wallachia and 75 for Moldavia. The members of both houses are chosen by indirect election—i. e., the first voters nominate electors, who choose the members. All citizens who have reached their 25th year, and who can read and write, are voters in the first instance, and every Rouman who possesses a small yearly income is eligible for a seat in parliament. The prince has a suspensive veto over all laws passed by both chambers. He is also chief of the executive, which is composed of a council of seven ministers, heads of the departments of the interior, of foreign affairs, of war, of finance, of justice, of commerce and agriculture, and of religion and public instruction. Judges are removable at the pleasure of the superior authorities. The legal codes are founded upon the civil law and the customs of the principalities; but though the system of jurisprudence has been much amended, many reforms remain to be effected, especially in the administration of the laws, which is said to be most corrupt.

Religion.—The established religion of Roumania is that of the Greek church, to which nearly the whole population belong; but all forms of Christianity are tolerated, and their professors enjoy equal political rights. At the head of the Greek clergy stand the metropolitan archbishops of Moldavia and Wallachia, the latter of whom is primate of Roumania. Every bishop is assisted by a council of clergy, and has a seminary for priests; the superintendent of the preaching clergy is the *proto-papa* of the diocese. The ecclesiastical wealth of the country was formerly very great, but the increased expenditure that followed the union of the two states rendered a scheme of spoliation the only means left to the government to extricate itself from its difficulties—in a word, the convent-properties were wrested from the hands of the Greek monks, and placed under the administration of the state. It had been the fashion to establish such convents in Turkey as supports to the orthodox faith, and the institutions in the principality itself were richly endowed in land and other ways: it was resolved to apply the revenues to the relief of national needs, such as schools, hospitals, the support of the poor, etc., and to give only the overplus to the clergy. . This has considerably increased the revenue of the state. The administration, however, is now put upon a better footing.

Education.—There are upwards of 2,000 elementary schools, besides normal schools, gymnasia, private schools, etc., in all about 2,500 schools. There are two universities. Education is gratuitous and compulsory. There are numerous French boarding-schools, and French is now the language of the educated circles, especially ladies (as Greek used to be), but the state language and the proper national tongue is the Romanic.

Army.—The military force of Roumania is organized on the plan of the Russian army, and the staff-officers are principally Russian. The militia is formed by the peasantry in the proportion of two men for every 100 families; but along the banks of the Danube all the inhabitants capable of bearing arms are organized into a military force. By the law of 1872 all natives of Roumania from twenty to forty are liable to military service in the standing army, four years active and four in the reserve. The militia is composed of all who have been in the standing army at any age between twenty and thirty-six. In 1877 the entire Roumanian military force numbered 144,668 men, but of these only 42,449 belonged to the regular or "permanent" army.

Commerce.—The total value of the imports of Roumania in 1874 amounted to 92,000,000 *lei* (=a franc), or about £3,700,000; and of the exports, 158,000,000 lei, or about £6,320,000. The principal article of export is grain, especially wheat and maize. Roumanian industry has largely profited by the construction in recent years of several lines of railway. In 1869 the first line, 42 English miles in length, was opened from Bucharest to Giurgevo on the Danube, and in subsequent years a network of railways was completed, connecting the capital with western Europe through the towns of Pivesti, Buzeo, Braila, Tekutch, Roman, and Succava, and from thence to Lemberg in Austria. In 1878 there were also 2,750 miles of telegraph in the principalities. The estimated revenue in 1879 was £4,366,500, just balanced by the expenditure; the public debt was, in 1880, about £24,400,000.

Race, Language, and Literature.—The great majority of the inhabitants are known in western Europe as Wallachs, but they call themselves Romĕni. The Wallachs, however, are not confined to the principalities, but inhabit also the southern part of Bukowina, the greater part of Transylvania, eastern Hungary, a part of the Banat, Bessarabia, some districts in Podolia and Kherson, and portions of eastern Servia. They are also found in Macedonia, Albania, and Thessaly. They are a mixed race, produced by the amalgamation of the emperor Trajan's Roman colonists with the original Dacian population, and subsequently modified by Grecian, Gothic, Slavic, and Turkish elements. This mixture is seen in their language, three-fourths of the words of which are Latin (the Dacian has disappeared), while the remaining fourth is made up of words from the other four languages. Wallachian literature is rich in popular songs; since the 16th c. many works in prose and verse have been printed, and of late years two political journals in the Wallachian tongue have been established, one at Bucharest, and another at Jassy. A *Grammatica Daco-Romana* was published by Johann. Alexi (Vienna, 1826); and a *Historia Linguæ Daco-Romanæ* by Laurianus (Vienna, 1849). A large Latin-Romanic-Hungarian dictionary was carefully executed by the bishop of Fogarasch, Joh. Bob (3 vols. Klausenburg, 1839).

Social Condition.—Very recent statistics on this point are not attainable. In Moldavia there are rather less, in Wallachia considerably more than 3,000 bojars, besides whom there is an extensive inferior nobility. In Wallachia every twenty-eighth man is a nobleman; every one hundred and thirty-third a merchant; and in the capital every twentieth is a merchant. The free peasants, or yeomen, called *Reseschs*, are not numerous—in all Wallachia there are under 5,000. Gypsy communities are an important element in the population; upwards of 150,000 of this mysterious race are or were serfs belonging to the rich bojars and the monasteries. In 1844 about 30,000 were emancipated, and settled in colonies in different parts of the land; they call themselves *Romnitschel* or *Romni*. The common people are on the whole good-humored, frugal, sober, and cleanly; murder and larceny are almost unknown. Their dwellings, however, are, as may be supposed, of the most wretched description; composed chiefly of interlaced willow-withes, covered with mud, cane, and straw.

History.—In ancient times Moldavia and Wallachia formed an important part of Dacia (q.v.), and the two countries have in general experienced the same vicissitudes At the period of the migration of nations, and in the following centuries they were the scene of the struggles between the Gothic, Hunnic, Bulgarian, and Slavic races—the Avari, Chazars, Petschenegi, Uzi, and Magyars, who alternately ruled or were expelled from the country. These peoples all left some traces (more or less) of themselves among the Romanized Dacian inhabitants, and thus helped to form that composite people, the modern Wallachs, who, in the 11th c., were converted to the Christianity of the Eastern or Greek church. Their incursions, however, frightfully devastated the country. In the 11th c., the Kumans, a Turkish race, established in Moldavia a kingdom of their own. Two centuries later the great storm of Mongols broke over the land. It now fell into the hands of the Nogai Tartars, who left it utterly wasted, so that only in the forests and mountains was any trace left of the native Wallachian population. In the latter half of the 13th c., a petty Wallach chief of Transylvania, Radu Negru of Fogarasch, entered

Wallachia, took possession of a portion of the country, divided it among his bojars (noble followers), founded a senate of 12 members, and an elective monarchy; and gradually conquered the whole of Wallachia. Rather less than a century later (1354), a similar attempt, also successful, was made by a Wallach chief of the Hungarian Marmarosh, of the name of Bogdan, to re-people Moldavia. In the beginning of the 16th c., both principalities placed themselves under the protection of the Porte, and gradually the bojars lost the right of electing their own ruler, whose office was bought in Constantinople. After 1711 the Turks governed the countries by Fanariot princes (see FANARIOTS), who in reality only farmed the revenues, enriched themselves, and impoverished the land. In 1802 the Russians wrested from Turkey the right of surveillance over the principalities. A great number of nobles—through family marriages with the Fanariots—were now of Greek descent, the court-tongue was Greek, and the religious and political sympathies of the country were the same. Hence the effort of the principalities in 1821 to emancipate themselves from Turkish authority, which was only the prelude to the greater and more successful struggle in Greece itself. In 1822 Russia forced Turkey to choose the princes or hospodars of Wallachia and Moldavia from natives, and not from the corrupt Greeks of Constantinople; and after 1829, to allow them to hold their dignity for life. The principalities, united under one ruler in 1858, were brought under one administration in 1861. For subsequent history, see ROUMANIA.

MOLE, *Talpa*, a genus of quadrupeds of the order *insectivora*, and family *talpidæ*. All the *talpidæ* live chiefly underground, and their structure is adapted to their mode of life. In their general form, the character of their fur, the shortness of their limbs, the great muscular strength of the fore-parts, and great breadth of the fore-paws, the elongated head, the elongated and flexible snout, the smallness of the eyes, and the complete concealment of the ears, they all resemble the COMMON MOLE (*T. Europæa*), with which also they pretty nearly agree in the nature of their food, their mode of seeking it, their dentition, and the shortness of their alimentary canal.—The common mole is abundant in most parts of Europe, except the utmost n. and the utmost south. In Britain it is very plentiful, except in the n. of Scotland; but is not found in Ireland nor in some of the Scottish islands. Instead of its ordinary uniform black color, it is occasionally found yellowish white, or gray, and even orange. Its silky or velvety fur lies smoothly in every direction, the short hairs growing perpendicularly from the skin; a peculiarity which preserves it clean as the animal moves either backwards or forwards in its subterranean galleries. The fore-paws are not only very broad, but are turned outwards, for the better throwing back of the earth in burrowing. They are terminated by five long and strong claws. The phalangeal bones are remarkable for breadth and an elongated bone of the carpus gives additional strength to the lower edge of the paw. The two bones of the forearm are fastened together. The shoulder-blades and the clavicles are very large: and the sternum has an elevated ridge as in birds and bats, for the attachment of powerful muscles. The muscles which move the head are also very powerful, and the cervical ligament is even strengthened by a peculiar bone; the mole making much use of its flexible snout in burrowing. The hinder limbs are comparatively feeble, and the feet small, with five toes. The eyes are black and very small, capable of being partially retracted and exserted. The senses of hearing, taste, and smell are very strongly developed in the mole. The cutting-teeth are very small and sharp; the canines long and sharp; the true molars broad, with many sharp conical elevations. This dentition adapts the animal for feeding not only on worms and grubs, but also on frogs, birds, and small quadrupeds, which accordingly are its occasional prey, although earthworms are its chief food. The mole is an excessively voracious animal; digestion is rapid, and no long interval can be endured between meals, hunger soon ending in death. When pressed by hunger, it will attack and devour even one of its own kind; and its practice is immediately to tear open the belly of any bird or quadruped which it has killed, and inserting its head, to satiate itself with the blood. In eating earthworms, it skins them with remarkable dexterity. In quest of them, it works its way underground, throwing up the earth in mole-hills; more rarely in the fine nights of summer it seeks for them on the surface of the ground, when it is itself apt to be picked up by an owl equally in want of food. The habitation of the mole is of very remarkable construction; a hillock of earth larger than an ordinary mole-hill, and containing two circular galleries, one above the other, with five connecting passages, and a central chamber which has access to the upper gallery by three passages; whilst about nine passages lead away from the lower gallery in different directions. The end of a passage entering a gallery on one side is never opposite to the end of a passage entering on the other. To afford all facility of escape in case of any alarm, a passage leads at first downwards from the central chamber, and then upwards again till it joins one of the high roads which the mole keeps always open, which are formed by pressing the earth till it becomes smooth and compact, and are not marked by any mole-hills thrown up, and which not only serve for escape when necessary, but lead to those parts of the creature's appropriated domain where the ordinary mining for worms is to be prosecuted. The nest in which the female mole produces her young is not this habitation, but is formed generally under a mole-hill rather larger than usual, where two or three runs meet, and is lined with leaves and other warm materials. The mole breeds both in spring and autumn, and generally produces four or five young at a birth. The attachment of the parent moles seems to be strong, but transitory.

It has been sometimes alleged that moles eat vegetable as well as animal food, and that they are injurious to farmers, by devouring carrots and other roots; but it appears rather that they only gnaw roots when in the way of their mining operations, or perhaps, also, in quest of grubs which they contain. Moles are generally regarded as a pest by farmers and gardeners, owing to the injury which mole-hills do to lawns and pastures, the burying up of young plants, and the disturbance of their roots. But they are certainly of use in the economy of nature in preventing the excessive increase of some other creatures; and probably also contribute to the fertility of some pastures, by the continual tillage which they carry on. Mole-traps of various kinds are in use, which are planted, if the mole-catcher is skillful, in the often-traversed roads of the animals. Mole-catching has long been a distinct trade in Britain.

The name mole is abbreviated from the old English name *mouldwarp*, or *mouldiwarp*, still provincially used, and which is derived from the Anglo-Saxon *molde*, mould, and *weorpan*, to throw up.

Another species of mole (*T. cæca*) is found in the most southern parts of Europe; very similar to the common mole, but rather smaller, and having the eye always covered by the eyelid, so as to justify Aristotle's statement that the mole is blind.—A species, also very similar to the common mole, is found in North America.

Among the other *talpidæ* are the CHANGEABLE MOLE, or CAPE MOLE (*chrysochloris capensis*) of South Africa, which is remarkable as the only one of the mammalia that exhibits the splendid metallic reflections so frequently seen in some other classes of animals; the SHREW MOLE (q.v.) and the STAR NOSE (q.v.) of North America.

MOLE. See NAEVUS.

MOLÉ, LOUIS MATTHIEU, Comte, a French statesman, and a descendant of the famous French statesman and magistrate, Matthieu Molé (b. 1584; d. 1653), was b. at Paris, Jan. 24, 1781. His father, president of the parliament of Paris, died by the guillotine in 1794. His mother was a daughter of Malesherbes. Molé was for the most part his own preceptor, and displayed a wonderfully precocious love of hard work and independent reflection. In 1805 he published *Essais de Morale et de Politique*, in which he vindicated the government of Napoleon on the ground of necessity. The attention of the emperor was drawn to him; he was appointed to various offices in succession, and raised to the dignity of a count, and to a place in the cabinet. After Napoleon's return from Elba, he refused to subscribe the declaration of the council of state banishing the Bourbons forever from France, and declined to take his seat in the chamber of peers. In 1815 Louis XVIII. made him a peer, and he voted for the death of Ney. In 1817 he was for a short time minister of marine, but afterwards acted independently of party, and was one of the principal orators in the chamber of peers. In 1830 he became minister of foreign affairs in Louis Philippe's first cabinet, but only for a short time. In 1836 he succeeded Thiers as prime minister; but, in the eyes of the liberal party, he displayed too entire a devotedness to the wishes of the king, and thus rendered his ministry very unpopular, so that in 1839 he felt it necessary to resign. In 1840 he was chosen a member of the *Académie Française*. From that time he took little part in political affairs, but after the revolution of 1848 exerted himself, but in vain, to rally and unite the party of order in the assembly to which he had been elected. He died at Champlâtreux, Nov. 23, 1855. Molé was fiercely attacked and abused in the latter part of his political career, but it is not now believed that he was servile toward the court. He detested anarchy, and believed in the necessity of a strong government; but he loved genuine liberty, and always placed the constitution above the king. When Louis Napoleon's *coup d'etat* extinguished the republic, Molé proudly said that henceforth he could have nothing to do with politics.

MOLE-CRICKET, *Gryllotalpa*, a genus of insects of the cricket (q.v.) family (*achetidæ* or *gryllidæ*), remarkable for burrowing habits, and for the great strength and breadth of the fore-legs. The other legs are also large and strong, but of the form usual in the family.—The best known species (*G. vulgaris*) common in many parts of Europe, and pretty abundant in some places in England, but very local—is almost 2 in. long; of a velvety brown color; the wings, when folded, do not cover much more than one-half of the abdomen, although large when expanded. It uses its fore-legs not only for digging burrows in earth, but for cutting through or tearing off the roots of plants which come in its way. The mole-cricket feeds both on animal and vegetable substances, and often does no small injury to crops. The chirping, and somewhat musical call of the mole-cricket, produced in the same way as that of the common cricket, is heard chiefly in the end of spring and beginning of summer, and only in the evening or at night. In some parts of England this sound has gained it the name of *chur-worm*. Another local English name is *croaker*. The female mole-cricket prepares a curious nest, a rounded subterranean cell, about as large as a hen's egg, having a complicated system of winding passages around it, and communicating with it. In this cell she deposits from 100 to 400 eggs. The young live for some time in society. They run actively, both in the larva and pupa states. The mole-cricket is very combative, and the victor generally eats the vanquished.—A species of mole-cricket (*G. didactyla*) does great injury to the plantations of sugar-canes in the West Indies.—A curious Indian insect, of a closely allied genus (*schizodactylus monstrosus*). has prodigiously long wings, which, as well as the wing-covers, are rolled into spiral coils at the tips.

MOL'ECULE, MOLEC'ULAR VOLUMES. See ATOM; ATOMIC THEORY; CHEMISTRY, *ante*.

MOLENBEEK, ST. JEAN, a t. in Belgium, in the suburbs of Brussels; pop. 37,292. It has a museum of natural science.

MOLE-RAT, *Spalax* or *Aspalax*, a genus of rodent quadrupeds of the family *muridæ*, having teeth almost like those of rats, but in many respects resembling moles, as in general form, shortness of limbs, concealment of ears, smallness or even rudimentary condition of eyes, and burrowing habits—although their food is altogether different, consisting wholly of vegetable substances, and chiefly of roots. One species (*S. typhlus*) inhabits the s. of Russia and some parts of Asia. It is also known as the *Podolian marmot, blind rat, slepez, zemni*, etc. The mole-rat makes tunnels and throws up hillocks like the mole, but its hillocks are much larger.—Another species, found in the Malayan archipelago, is as large as a rabbit.—Nearly allied is the COAST RAT or SAND MOLE of s. Africa (*bathyergus maritimus*), also as large as a rabbit, with other species of the same genus, also natives of s. Africa, which drive tunnels through the sandy soil, and throw up large hillocks.

MOLESCHOTT, JACOB, b. Holland, 1822; took a medical degree at Heidelberg, and began the practice of medicine at Utrecht, whence he removed, in 1847, to Heidelberg, where for seven years he lectured on physiology at the university. A real or supposed tendency towards materialism, in his lectures, alarmed the authorities, and he resigned. Soon after he was appointed professor at Zurich, and in 1861 he was called to the chair of physiology at Turin. His physiological researches, particularly in regard to diet, muscular formation, the blood and bile, are of value. Without asserting the impossibility of a spiritual life, he explains the origin and the condition of animals by the working of physical causes. His characteristic formula is, "No thought without phosphorus." His most important works are: *Lehre der Nahrungsmittel*, 1850, which has been translated into English by Dr. Bonner as *The Chemistry of Food and Diet; Physiologie der Nahrungsmittel*, 1850; *Ursache und Wirkung in der Lehre vom Leben*, 1867; and *Von der Selbstbestimmung im Leben der Menscheit*, 1871.

MOLESKIN AND COR'DUROY are varieties of fustian (q.v.), a term which is used in a generic sense to include also velveteen, velveret, thick-set, thick-set cord, beaverteen, and other stout cotton cloths for men's apparel—a class of goods largely manufactured in Lancashire. The general structure of these fabrics is described under FUSTIAN and VELVET. They are, in point of fact, all of the nature of velvet, with a *nap* or *pile* on the surface, and most of them are twilled.

When cloth of this kind leaves the loom, its surface is covered with loops like Brussels carpet, and these are then cut open with a ripping knife of a peculiar shape, which the operatives learn to use with great dexterity. The hairy and uneven appearance which the cloth acquires in this operation is subsequently improved by the shearing process. The cloth is next steeped in hot water, to get rid of the paste used in dressing the yarn, and is then ready to be passed through the brushing or teaseling machine, which consists of blocks of wood with concave surfaces covered with card-brushes, working backwards and forwards in a lateral direction against wooden rollers, encased in tin plate, over which the cloth passes. The tin plate is made rough with the burs of punched holes. In the next operation, the fustian is singed by passing the nap side quickly over a red-hot metal cylinder. The brushing and singeing are repeated three and occasionally four times, to give the cloth a smooth appearance. It is then washed, bleached with chloride of lime, and dyed—usually of some shade of olive, slate, or other quiet color.

The different names given to fustian cloths depend upon their degree of fineness, and the manner in which they are woven and finished. Thus, smooth kinds, of a strong twilled texture, are called *moleskins* when shorn before dyeing, and *beaverteens* when cropped after dyeing. Corduroy, or king's cord, is produced by a peculiar disposition of the pile-threads. In all fustians, there is a warp and weft thread, independent of the additional weft-thread forming the pile; but in corduroys, the pile-thread is only "thrown in" where the corded portions are, and is absent in the narrow spaces between them.

Until a comparatively recent period, the quantity of fustian cloths annually consumed in the British islands must have been very large, but the increased price of cotton, and the introduction of cheap woolen fabrics, have now very much curtailed the use of them. They are still, however, largely worn by certain classes of mechanics and laborers.

MOLESTA'TION, in Scotch law, means disturbing the possession of heritage, and an action of molestation is a remedy for the trespass.

MOLESWORTH, GUILFORD LINDSAY, b. England, 1828; educated at the college of civil engineers at Putney. In 1852 he became chief assistant engineer of the London, Brighton, and South Coast railroad, but soon resigned to conduct the constructions at Woolwich arsenal during the Crimean war. After practicing his profession in London for a number of years, he went to Ceylon, and in 1862 became chief engineer of the government railroad in that island. In 1867 he was appointed director of public works; and in 1871 consulting engineer to the Indian government. He has published a *Pocket-book of Engineering Formulæ*.

MOLESWORTH, Sir William, Right Honorable (eighth baronet), English statesman, was b. in 1810. Lineally descended from an old Cornish family of large possessions (the first baronet was president of the council in Jamaica in the time of Charles II., and subsequently governor of that island), he early showed promise of distinction. His university career at Cambridge was, however, cut short by his sending (under circumstances of great provocation) a challenge to his tutor to fight a duel. He continued his education at the university of Edinburgh, and subsequently at a German university. After making the usual tour of Europe, he returned home, and threw himself, in 1831, into the movement for parliamentary reform. Next year, although only just of age, he was elected member of parliament for Cornwall (East). He sat for Leeds from 1837 to 1841, and then remained out of parliament four years, during which interval he used to say he gave himself a second and sounder political education. He was the intimate friend of Bentham and James Mill, and was regarded as the parliamentary representative of the "philosophical radicals." Having been a great admirer of Hobbes, he accumulated materials for a life of the "Philosopher of Malmesbury," which remains in MS. uncompleted. In 1839 he commenced and carried to completion, at a cost of many thousand pounds, a reprint of the entire miscellaneous and voluminous writings of that eminent author. The publication was a valuable contribution to the republic of letters, and the works of Hobbes were placed by Molesworth's munificence in most of our university and provincial public libraries. The publication, however, did him great disservice in public life, his opponents endeavoring to identify him with the freethinking opinions of Hobbes in religion, as well as with the great philosopher's conclusions in favor of despotic government. In 1845 he was elected for Southwark (which he continued to represent until his death), and entered upon a parliamentary career of the greatest energy and usefulness. He was the first to call attention to the abuses connected with the transportation of criminals, and as chairman of a parliamentary committee brought to light all the horrors of the convict system. He pointed out the maladministration of the colonial office, explained the true principles of colonial self-government, prepared draught constitutions for remote dependencies, and investigated the true and natural relations between the imperial government and its colonial empire. Molesworth's views, although at first unpalatable to the legislature, have been adopted by successive administrations, and are now part and parcel of the colonial policy of Great Britain. In January, 1853, he accepted the office of first commissioner of public works, in the administration of the earl of Aberdeen; and in 1855 the post of secretary of state for the colonies, in that of viscount Palmerston. This appointment gave great satisfaction to our dependencies; but before he could give proof of his administrative capacity, he was (Oct. 22, 1856) struck by the hand of death, while yet in the full vigor of life and intellect. He established the *London Review*, a new quarterly, in 1835; and afterwards purchased the *Westminster Review*, the organ of the "philosophical radicals." The two quarterlies being then merged into one, under the title of the *London and Westminster*, Molesworth contributed to it many able articles on politics and political economy.

MOLESWORTH, William Nassau, b. England, 1816; was educated at Cambridge and entered the English church. He was presented to St. Andrews, Manchester, in 1841, and to St. Clement Spotland, Rochdale. He has been an advocate of co-operation, and has taken part in the well-known experiment of co-operation at Rochdale. His most important writings are *A History of the Reform Bill of* 1832 and *History of England from the Year* 1830, 3 vols., 1871–73.

MOLFET'TA, a city of southern Italy, in the province of Bari, situated on the Adriatic, 18 m. n.w. of Bari; pop. '72, 26,829. The neighborhood yields excellent fruits, especially almonds and oranges, and has extensive olive plantations. Fish abound along the coast. The city contains a magnificent cathedral, and is partly inclosed by walls; it is conjectured that it occupies the site of some early forgotten town, from the numerous vases, urns, and other relics of antiquity found in its vicinity.

MOLIÈRE, Jean Baptiste (properly, *Jean Baptiste Poquelin*—the name of Molière not having been assumed till he had commenced authorship, was b. at Paris, Jan. 15. 1622. His father, Jean Poquelin, was then an upholsterer, but subsequently became a valet-de-chambre to the king. Regarding the boyhood of Molière almost nothing is known, but his credulous biographers have put together whatever traditionary gossip they could find floating on the breath of society. Voltaire, while recording these *contes populaires*, as he calls them, pronounces them *très-faux*. All that we really are certain of is that in his 14th year he was sent to the Jesuit *collége de Clermont* in Paris, where he had for a fellow-student prince Armand de Conti, and that, on leaving the college, he attended for some time the lectures of Gassendi. He was charmed, we are told, by the freedom of thought permitted in speculative science, and, in particular, conceived a great admiration for Lucretius, the Roman poet-philosopher, whom he undertook to translate. Of this translation, only a single passage remains, intercalated in the *Misanthrope* (act ii. scene 4). About 1641 he commenced the study of law, and appears to have even passed as an advocate; but the statement of Tallement des Réaux that he actually ventured into the precincts of theology, is generally rejected. Molière detested priests. . So gay, humorous, and sharp-eyed a humanitarian would have felt quite miserable under the restraints of a monkish life. In 1645 he suddenly appeared upon the stage as member of a company of strolling players, which took the name of the *Illustre Théâtre*, and performed at first in the faubourgs of Paris, and afterwards in the provinces. For the next 12 years we can only catch an occasional glimpse of him. He was playing at Nantes and Bordeaux in 1648, at Narbonne and Toulouse in 1649, at Lyons in 1653 (where his first piece, *L'Etourdi*, a comedy of intrigue, was brought out), at Lyons and Narbonne again in 1655, at Grenoble during the carnival, and also at Rouen in 1658. During these now obscure peregrinations, he seems, although an industrious actor, to have been also a diligent student. He read Plautus, Terence, Rabelais, and the Italian and Spanish comedies, besides—without which, indeed, all the rest would have been of little avail—making a constant use of as quick eyes as ever glittered in a Frenchman's head. At Paris, by the powerful recommendation of his old schoolfellow, the prince de Conti, Molière's company got permission to act before the king, who was so highly pleased, that he allowed them to establish themselves in the city under the title of the *Troupe de Monsieur*. In 1659 Molière brought out *Les Précieuses Ridicules*, the fine satire of which—lapsing at times, however, into caricature—was instantly perceived and relished. "*Courage, Molière!*" cried an old man on its first representation; "*voilà la véritable comédie.*" The old man was a prophet. Veritable comedy dated in France from that night. Ménage, the critic, is reported to have said to Chapelain the poet, as they were going out of the theater: "Henceforth (as St. Remi said to Clovis), we must burn what we have worshiped, and worship what we have burned. In 1660 appeared *Sganarelle, ou le Cocu Imaginaire;* and in 1661 *L'Ecole des Maris*—partly founded on the *Adelphi* of Terence, in which Molière completely passes out of the region of farce into that of pure comic satire—and *Les Fâcheux*. In the following year, Molière married Armande-Grésinde Béjart, either the sister or daughter (for it is still undetermined) of Madeleine Béjart, an actress of his troupe, with whom he had formerly lived in what the French politely call "intimate relations." That, however, there is the slightest ground for supposing that the great comedian incestuously married his own daughter, nobody now believes, though the revolting calumny was freely circulated even in Molière's lifetime. His literary activity continued as brisk as before. Among several pieces belonging to this year, the most celebrated is *L'Ecole des Femmes*, which excited, not without reason, the most violent indignation among the clergy and the devout, for there was an excessive indecency in the expression, and the author indulged in a caricature of religious mysteries that could not but be offensive. Molière defended himself with incredible audacity in his *Impromptu de Versailles*. *Le Tartufe*, written in 1664, was prohibited from being brought upon the stage; but Molière was invited by his literary friends, Boileau and others, to read it in a semi-public manner, which he did with the greatest approbation. In 1665 Louis XIV. bestowed a pension of 7,000 livres on Molière's company, which now called itself the *Troupe du Roi*. Next year appeared *Le Misanthrope*, the most artistic of all his comedies; shortly after followed by *Le Médecin Malgré Lui*. When *Tartufe* was at last brought upon the stage in 1669, it obtained a superb success. The truth, the variety, the contrast of the characters, the exquisite art shown in the management of the incidents, the abundance of the sentiments, and the wonderful alternations of feeling—laughter, anger, indignation, tenderness—make this, in the opinion of most critics, Molière's masterpiece. To the same year belongs *L'Avare*. In 1670 appeared *Le Bourgeois Gentilhomme*, a very pleasant satire on a very prevalent vice among wealthy tradesmen—viz., the vulgar ambition to pass for fine gentlemen. Then came *Les Fourberies de Scapin* (1671), followed by *Les Femmes Savantes* (1672), full of admirable passages; and *Le Malade Imaginaire* (1673), the most popular if not the best of all Molière's comedies. While acting in this piece, he was seized with severe pains, which, however, he managed to conceal from the audience; but on being carried home, hemorrhage ensued, and he expired at ten o'clock at night (Feb. 17, 1673). As Molière had died in a state of excommunication, and without having received the last aids of religion—which, however, he had implored—the archbishop of Paris refused to let him be buried in consecrated ground; but the king interfered—a compromise was effected, and he was privately interred in the cemetery of St. Joseph, being followed to the tomb by a hundred of his friends with lighted torches. In 1792 his remains were transferred to the museum of French monuments, from which they were removed to Père Lachaise in 1817. Molière ranks as the greatest French comic dramatist—perhaps the greatest of all comic dramatists. Among the best editions of Molière's works are those of Auger (1819–25), Aimé-Martin (1833–36), Moland (1871), and Despois (1874 *et seq.*). A complete English translation of Molière's works is that by Van Laun, in 6 vols. (Edin. 1875–76). The best biographies are by Taschereau (1825–27), and Bazin (1851). The books devoted to Molière and his works would themselves form a large library.

MOLINA, Fray ALONSO DE, 1496–1584; b. Spain; entered the order of St. Francis. He went to Mexico to convert the natives soon after the Spanish conquest, and familiarized himself with the Aztec language. He made translations into Aztec of the catechism and of a confessional manual. He also wrote a grammar of that language, but his great work is his *Aztec-Spanish Dictionary*, completed in 1571.

MOLINA, Louis, a celebrated Spanish Jesuit theologian, was b. at Cuença, in New Castile, in the year 1535; and having entered the Jesuit society in his 18th year, studied at Coimbra, and was appointed professor of theology at Evora, where he continued to teach for 20 years. He died at Madrid in 1600 in the 65th year of his age. Molina's celebrity is mainly confined to the theological schools. His principal writings are a commentary on the *Summa* of St. Thomas (Cuença, 2 vols. 1593); a minute and comprehensive treatise *On Justice and Right* (Cuença, 6 vols. 1592; reprinted at Mainz in 1659); and the celebrated treatise on *The Reconciliation of Grace and Free-Will,* which was printed at Lisbon in 1588, with an appendix, printed in the following year. Although it is to the last-named work that Molina's celebrity is mainly due, we must be content with a very brief notice of it. The problem which it is meant to resolve is almost as old as the origin of human thought itself, and has already led, in the 4th c., to the well-known Pelagian controversy (q.v.). In reconciling with the freedom of man's will the predestination of the elect to happiness, and of the reprobate to punishment, Molina asserts that the predestination is consequent on God's foreknowledge of the free determination of man's will, and, therefore, that it in no way affects the freedom of the particular actions, in requital of which man is predestined, whether to punishment or to reward. God, in Molina's view, gives to all men sufficient grace whereby to live virtuously, and merit happiness. Certain individuals freely co-operate with this grace; certain others resist it. God foresees both courses, and this foreknowledge is the foundation of one or of the other decree. This exposition was at once assailed in the schools on two grounds—first as a revival of the Pelagian heresy, inasmuch as it appears to place the efficacy of grace in the consent of man's will, and thus to recognize a natural power in man to elicit supernatural acts; second, as setting aside altogether what the Scriptures represent as the special election of the predestined, by making each individual, according as he freely accepts or refuses the grace offered to all in common, the arbiter of his own predestination or reprobation. Hence arose the celebrated dispute between the MOLINISTS and the THOMISTS. It was first brought under the cognizance of the inquisitor-general of Spain, by whom it was referred to pope Clement VIII. This pontiff, in 1697, appointed the celebrated congregation, *De Auxiliis,* to consider the entire question; but notwithstanding many lengthened discussions, no decision was arrived at during the life-time of Clement: and although the congregation was continued under Paul V., the only result was a decree in 1607 permitting both opinions to be taught by their respective advocates, and prohibiting each party from accusing the adversaries of heresy. The dispute, in some of its leading features, was revived in the Jansenist controversy (see JANSEN); but with this striking difference, that whereas the rigorous Jansenists denied the freedom of the will when acted on by efficacious grace, all the disputants in the scholastic controversy—even the Thomists—maintain that, in all circumstances, the will remains free, although they may fail to explain how this freedom is secured under the action of efficacious grace. See AQUINAS.

MOLINE', a t. in Rock Island co., Ill., on the e. bank of the Mississippi and on the line of the Western Union, Chicago, Rock Island and Pacific, and the Rockford, Rock Island and St. Louis railroads; pop. of township about 6,000. Fine water-power is obtained by a dam reaching from the shore to an island in the river, and from 20 to 25 factories are constantly in operation manufacturing steam-engines, pumps, plows, paper, and many other articles. The place has 3 banks, a weekly paper, a public library, many churches, and a very fine public school.

MOLINELLA, a t. in the province of Bologna, in n. Italy, between the Reno and Po rivers. Pop. 10,751. The chief industry is the manufacture of cheese and hemp. The town was anciently situated on separate islands formed by changes in the course of the Po; these islands have been joined and built over.

MO'LINISM, the name given to the system of grace and election taught by Louis Molina (q.v.). This system has been commonly taught in the Jesuit schools; but a modification of it was introduced by the celebrated Spanish divine Suarez (q.v.), in order to save the doctrine of *special election.* Suarez held, that although God gives to all grace absolutely sufficient for their salvation, yet he gives to the elect a grace which is not alone in itself sufficient, but which is so attempered to their disposition, their opportunities, and other circumstances, that they infallibly, although yet quite freely, yield to its influence. This modification of Molina's system is called CONGRUISM. Molinism must not be confounded either with Pelagianism or semi-Pelagianism, inasmuch as Molinism distinctly supposes the inability of man to do any supernatural act without grace (q.v.).

MOLI'NO DEL REY. An outpost of Chapultepec, about 2½ m. from the city of Mexico, where occurred a battle Sept. 8, 1847, between the American troops under gen. Winfield Scott and the Mexicans commanded by gen. Santa Anna. Scott's force numbered about 10,000 men; the Mexicans about 7,000 picked men, with a reserve of 12,000. Scott had captured Contreras and Churubusco, and sat down under the walls of Chapultepec from Aug. 20 to Sept. 7, while an armistice existed to enable Nicholas P. Trist, peace commissioner, to conclude an amicable arrangement if possible. At the close of the armistice, the peace negotiations having proved ineffectual, Scott attacked Molino del Rey, which comprised a number of massive stone buildings, about 500 yards in extent, commanded by the defenses of the great fortified castle of Chapultepec, where were

14,000 Mexicans. This position had been originally a flour-mill (*molino*), and was afterwards a foundry for the manufacture of arms, and now a fortress defended by Mexican veterans. It was attacked by Scott on the morning of Sept. 8, and, though the battle was a hard-fought one on both sides, it was carried by storm on the same day, thus opening the way to the capture of Chapultepec and the city of Mexico.

MOLINOS, MICHAEL DE, was b. of noble parentage at Patacina, in the kingdom of Aragon, Dec. 21, 1627. He received holy orders and was educated at Pampeluna, and afterwards at Coimbra, at which university he obtained his theological degree. After a career of considerable distinction in his native country, Molinos went to Rome, where he soon acquired a high reputation as a director of conscience and a master of the spiritual life. His private character was in keeping with this public reputation. He steadily declined all ecclesiastical preferment, and confined himself entirely to his duties in the confessional, and in the direction of souls. An ascetical treatise which he published, under the title of *The Spiritual Guide*, added largely to the popularity which he had acquired in his personal relations; but there were not wanting many who, in the specious, but visionary principles of this work, discovered the seeds of a dangerous and seductive error. Among these, the celebrated preacher, F. Segneri, was the first who ventured publicly to call them into question; but his strictures were, by the friends of Molinos, ascribed to jealousy of the influence which Molinos had acquired with the people. By degrees, however, reports unfavorable to the practical results of this teaching, and even to the personal conduct and character of Molinos or of his followers, began to find circulation; and eventually, in the year 1685, he was cited before the holy office, and submitted to close imprisonment and examination. In addition to the opinions contained in his book, a prodigious mass of papers and letters, to the number, it is said, of 20,000, found in his house, were produced against him, and he was himself rigorously examined as to his opinions. The result of the trial was a solemn condemnation of 68 propositions, partly extracted from his *Spiritual Guide*, partly, it would appear, drawn from his papers or his personal professions. These doctrines Molinos was required publicly to abjure, and he was himself sentenced to close imprisonment, in which he was detained until his death in 1696, when he had entered on his 70th year. The opinions imputed to Molinos may be described as an exaggeration of the worst and most objectionable principles of quietism (q.v.). According to the propositions which were condemned by the inquisition, Molinos pushed to such an extreme the contemplative repose which is the common characteristic of quietism, as to teach the utter indifference of the soul, in a state of perfect contemplation, to all external things, and its entire independence of the outer world, even of the actions of the very body which it animates; insomuch that this internal perfection is compatible with the worst external excesses. These consequences are by no means openly avowed in the *Spiritual Guide*, but they appear to follow almost necessarily from some of its maxims, and they are said to have been plainly contained in the papers of Molinos, which were produced at his trial, and to have been admitted by himself. After the death of Molinos, no further trace of his teaching appears in Italy, but it was revived in more than one form in France.

MOL'LAH, among the Turks, is the title of a superior judge. The mollahs are divided into two classes: the first of these, four in number, from whom the mollahs at the court of the padishah are elected, possesses jurisdiction over the more important pashaliks (Adrianople, Brusa, Damascus, Cairo); and the second, who only hold their office for the space of a lunar month at a time, and the lowest rank of whom is formed by the naibs, over the inferior provinces, towns, and villages. The mollah is an expounder of civil and criminal law, and of the religion of the state; he is therefore necessarily both a lawyer and an ecclesiastic. Under him is the cadi or judge, who administers the law, and superior to him are the kadhiasker and the mufti (q.v.). They all are, however, subject to the sheikh al islam or supreme mufti. In Persia, the office of mollah is similar to what it is in Turkey; but his superior is there the "sadr," or chief of the mollahs. In the states of Turkistan, the mollahs have the whole government in their hands.

MOLLASSE, an extensive miocene or middle tertiary deposit, occupying the central lake-region of Switzerland between the Alps and the Jura. It consists chiefly of a loose sand, but at the foot of the Alps it usually takes the form of a conglomerate called "Nagel-flue," which is said to attain the astonishing thickness of from 6,000 to 8,000 ft. in the Righi, near Lucerne, and in the Speer, near Wesen. The mollasse contains a few shells and some vegetable remains, among which are several palms.

MOLLER, GEORG, 1784–1852; b. Hanover; studied architecture in Carlsruhe and Italy. After his return from Italy he was appointed government architect to the grand duchy of Darmstadt. He designed the ducal palace at Wiesbaden, and a number of the public buildings as well as private residences at Darmstadt. He discovered the original design of the Cologne cathedral, the two towers of which have been finished in accordance with his published fac-simile of that design. His most important publications are: *Monuments of German Art* and *Monuments of German Architecture.*

MOLLITIES OSSIUM, or OSTEOMALACIA, a destructive disease of the bones, characterized by softening and fragility. It has been carefully studied by Curling, Solly, Stanley, MacIntyre, and Litzmann, and also by Paget and Dalrymple. The bones become bent, their extremities swollen, and their shafts broken in various parts of the body. No callus follows the fracture as in healthy bone, and in consequence the body of the patient becomes much distorted. On examining the bones after death, they are found light, soft, and gritty to the feel; exceedingly brittle, and of a reddish brown color. Cavities of various sizes, and of a round or oval shape, are also found, usually filled with an oily, reddish, grumous fluid, but sometimes with clear serum. The red grumous matter exhibits a cell development, and Solly regards it as a subsequent morbid product, and not simply altered fatty matter colored with blood. Dalrymple found caudate corpuscles in it, and regards it as malignant, in which opinion others agree. Virchow, however, considers that the peculiar cellular condition results from retrograde conversion of osseous into medullary substance. Paget regards mollities ossium as including two diseases—one more common in England, attended with fatty degeneration, and another called *osteoporisis* by the Germans, in which there is simply removal of earthy matter, and more common in Germany and France. He also believes the English affection generally attacks the bones of the extremities, while that form more often seen on the continent attacks the bones of the trunk. The cause of mollities ossium is rather obscure, but is frequently connected with rheumatic symptoms. In some cases a connection has been traced to syphilis. The physiological conditions which accompany it are those of mal-nutrition generally, abnormal digestion, assimilation, and disassimilation. It is a disease of adults, rarely attacking persons under 20 years of age, and the aged are also not exempt. Its subjects are more often females than males, and, in a majority of cases, it is connected with the child-bearing state. Of 131 cases collected by Litzmann of Kiel, there were 85 females in whom the disease occurred during pregnancy, or was modified by it. Of the remaining cases 46 were females and 11 were males. According to the same authority, the seat of the disease varies as it occurs within the child-bearing period or not. In the 85 child-bearing women the whole skeleton was affected in 6 cases only, and all the bones except those of the head in two; whilst in the 46 other cases not connected with the child-bearing period, all parts of the skeleton were diseased in 21, and all the bones except those of the head in 6. The urine always contains large quantities of earthy matter, chiefly phosphate of lime, which has been absorbed from the bony tissue and eliminated by the kidneys. The pelvis, or chamber of the kidney, is sometimes filled with phosphatic accretions, forming a solid calculus. At the commencement of the disease the diagnosis is very difficult, as the symptoms simulate those of rheumatism. It is important, however, to make the distinction as soon as possible, which may be done as soon as the phosphatic condition of the urine is manifested. It is readily distinguished from rickets, as the latter is peculiarly a disease of childhood, and has no tendency to spontaneous fracture of the bones. The treatment offers little encouragement, although judiciously selected tonics will sometimes afford temporary relief, and arrest for a short time the progress of the disease; but its tendency is progressive. In the latter stages opiates are indicated to relieve pain and produce sleep, and, with wine or other stimulants, are the only medicines required.

MOLLUS'CA, one of the great animal sub-kingdoms, including so wide a range of distinct forms that it is difficult to frame a definition that shall be applicable to all of them. The lowest forms, termed polyzoa (q.v.) or bryozoa, present so strong a resemblance to zoophytes, that until recently they were associated with the latter; whilst, on the other hand, in some of the most highly organized of this sub-kingdom, the cephalopoda, there is a decided approximation towards the vertebrated series, as is shown by the presence of a rudimentary cartilaginous skeleton, and by a peculiarity in the development of the embryo. The bilateral symmetry of external form which is almost universal in articulated and vertebrated animals, is here seldom met with; and taking them as a whole, the mollusca are characterized by the absence rather than by the presence of any definite form. The bodies of these animals are always of a soft consistence—a property to which they owe their name, which was devised for them by Cuvier, before whose time they were included in the *Vermes* of Linnæus's arrangement. The *shell*, when it exists, is not to be regarded as an exo-skeleton giving attachment to muscles, and regulating the form of the animal, but merely as an appendage designed for the protection of the body from which it derives its shape; indeed, it is only where the body is uncovered by a shell, or where the locomotive organs can be projected beyond it, that any active movements can be effected. The whole fabric is inclosed in a thick, soft, flexible skin, called the *mantle*, and it is on the surface of this envelope that the shell is formed by the development and subsequent calcification of epithelial cells. In many of the mollusca the shell is composed of a single piece, which is usually a spiral tube, closed at one end, and gradually increasing in size towards the open extremity, from which the animal is able to protrude itself. Shells of this description are called *univalves*. In others, the shell is composed of two pieces or valves, attached to each other at one point by a hinge, which is furnished with an elastic ligament that serves to open the valves, when it is not opposed by the action of the *adductor* muscles, whose office it is to keep the shell closed. Shells of this kind are termed *bivalves*. These differences in the character of the shell correspond with differences in the conformation of the animals inhabiting them. The bivalve mollusca exhibit no traces of a head, and hence are termed *acephalous* mollusca; while the univalves have a distinct head, provided with organs of the special senses, and hence, by way of distinction, some writers have termed them *cephalophora* (or head-bearing). Many mollusca are altogether unprovided with a shell, or have only a small calcareous plate embedded within the mantle. These are termed *naked* mollusca. It is worthy of notice that the young mollusc, while still in the egg, is almost always furnished with a delicate pellucid shell, even when it is ultimately to be naked, in which case the embryonic shell is cast off soon after the animal makes its escape from the egg. For the mode of formation, etc., of the shell, see SHELL.

The movements of many of the mollusca are executed by means of a muscular structure concentrated in some particular part or parts of the mantle, and termed the *foot.* In some (the gasteropoda), the foot forms a sort of flattened disk, by the alternate contraction and expansion of different parts by which the animal can slowly crawl forwards; whilst in others (the free-moving bivalves) it is a tongue-like organ, which can be protruded between the valves, and by its sudden extension, after being previously bent upon itself, can enable its possessor (the common cockle, for example) to take considerable leaps. The foot is also the agent by means of which certain species burrow in the sand or mud, and others bore into the solid rock. Many mollusca, however, are firmly attached to a single spot, except during their larval state; and as they do not require a foot, we find it either altogether undeveloped (as in the oyster), or serving to support a glandular organ, from which filaments of silky or horny matter (called the *byssus*) are secreted, which serve to attach the animal (the common mussel, for example) to rocks, stones, etc., beneath the water. Many of the subdivisions of the mollusca present modes of locomotion altogether independent of a foot, as, for example, the *biphora*, which are described in the article TUNICATA; those bivalves which possess a branchial or respiratory chamber, into which water is drawn, and again expelled by muscular action, a recoil being thus produced which serves to drive the animal through the water; the *pteropoda* (q.v.), which are furnished with a pair of broad flattened fins (which may possibly be regarded as a modified foot) at the sides of the head, by means of which they swim with tolerable rapidity; and the *cephalopoda*, in which the mouth is surrounded by a number of arms, which serve not only as organs of motion, but for the capture of prey.

The *nervous system* in the mollusca is developed in accordance with two distinct types. In the lowest group of this sub-kingdom (the molluscoids), there is only a single ganglion with afferent and efferent fibers radiating in every direction; while in the higher groups there are several ganglia lying somewhat irregularly in different parts of the body, and communicating by nervous threads with a larger mass placed in the head, or in the neighborhood of the œsophagus. This mass consists of several ganglia, which from their position are termed *supraœsophageal*, and is united by filaments with other ganglia lying below the œsophagus, so as to form a ring or collar around that organ. The supraœsophageal ganglia furnish the nerves to the special organs of the senses. Most of the mollusca possess special *organs of touch* in the form of lips or of special lobes around the mouth; of tentacles or arms upon the head, or of cirrhi upon other parts of the body; and in addition to these special organs, the skin appears to possess considerable sensibility. When tentacles are present, they are either two or four in number; and they can be protruded and retracted at pleasure, as every one must have noticed in the case of these organs (popularly known as *horns*) in the snail. *Organs of sight* are not universally present. In many mollusca there is only a single rudimentary eye, while in others there is a large number of imperfect eyes (termed *ocelli*), which do not of necessity lie in the region of the head. In the higher mollusca there are two eyes, sometimes placed directly on the head, and sometimes on the tentacles; and in the highest group (the cephalopods) the eyes are as fully developed as in fishes.

Organs of hearing, in a simple form, are almost always present. They usually consist of round vesicles in the neighborhood of the œsophageal ring, from which they receive a nervous filament. They contain a clear fluid and a small concretion of carbonate of lime, which is sometimes roundish, and sometimes of a crystalline form, and is in a perpetual state of vibration, in consequence of ciliary action in the interior of the vesicle. Whether there are any special *organs of smell* and *taste* in the mollusca is still undecided.

The organs of *vegetative* life (of digestion, circulation, etc.) are much more fully developed in the mollusca than those of *animal* life. The alimentary canal, which presents almost every variety of form from a simple cavity to a complicated intestine, is always provided with two distinct openings, a mouth and an anus, the latter being often situated (as in the gasteropoda and pteropoda) on the right side of the anterior part of the body. The liver is always present, existing in a mere rudimentary form in the polyzoa, constituting a large part of the body in the acephalous bivalve mollusca (as the mussel and cockle), and a still larger part in the gasteropoda (as the snail), while in the cephalopoda it is constructed upon nearly the same plan as in fishes. Other secreting organs, such as salivary glands, pancreas, and urinary organs, are also present in the more highly developed mollusca.

The circulation of the blood is effected (except in the polyzoa) by means of a distinct heart, which usually communicates with a regular, closed vascular system; but in some cases the venous system is imperfect, and the blood which has been transmitted by the arteries to the system in general is not confined within distinct vessels, but meanders through sinuses or passages excavated in the tissues, and through them it reaches the respiratory apparatus, whence it is transmitted by closed vessels (veins) to the heart. The blood is nearly colorless (sometimes of light blue or green tint), and contains but few floating corpuscles. In all but the very lowest mollusca there is a distinct respiratory apparatus, which, excepting in the case of the terrestrial gasteropoda (as, for example, the snail), is constructed with a view to aquatic respiration, and is composed of *branchiæ*, or gills. These branchiæ usually consist of a series of membranous plates (arranged like the leaves of a book or the teeth of a comb), over which the water flows. They are sometimes attached to the surface of the body, but are most commonly inclosed within the mantle, or placed in a cavity in its interior called the branchial or respiratory chamber. In many of the bivalves, the openings for the ingress and egress of water are prolonged into tubes or syphons, which are sometimes of considerable length; the tube through which the water enters being termed the *oral* syphon, while that through which it escapes is termed the *anal* syphon. In all the aquatic mollusca except the cephalopoda, the renewal of the water in contact with the surface of the gills is mainly due to ciliary action. In the air-breathing gasteropodous mollusca (of which the snails and slugs are well-known examples), there is a pulmonary sac or bag into which the air penetrates by an opening on the right side of the body near the neck.

There are considerable differences in the modes of *propagation* of the mollusca. In the molluscoids—the polyzoa and tunicata—there is both propagation by gemmation (like that of zoophytes, q.v.) and sexual reproduction, the sexes being distinct in the polyzoa, and united in the same individual (constituting hermaphroditism, q.v.) in the tunicata. In the lamellibranchiata, or bivalve mollusca, and in the cephalopoda, the sexes are separate; while in the gasteropoda the sexes are most commonly separate, although a considerable number are hermaphrodites, which, however, require mutual impregnation to fertilize the ova. The eggs vary greatly in form; in some cases they are laid separately, but most commonly they are agglutinated together in a mass, while in some marine species many eggs are inclosed in a leathery capsule, while numerous capsules are united to form a large mass. A comparatively few mollusca produce living offspring, the ova being retained in the oviduct until the extrusion of the young animals.

The mollusca are widely diffused through time and space. They were amongst the earliest animal inhabitants of our globe, and are everywhere found in fresh and salt water (except at great depths), and in every latitude of the earth. The great majority are marine animals, and it is in the tropical regions that the largest and most beautiful forms are developed. It is impossible to form even an approximate estimate of the number of mollusca. According to Leunis (*Synopsis der drei Naturreiche; erster Theil*, 1860, p. 77), there are 16,732 living, and 4,590 fossil species, exclusive of polyzoa; and it is probable that only a small proportion of the naked or shell-less mollusca is yet known.

The uses of many species of mollusca for food are too well known to require notice, and as bait for fishing, mussels and some other mollusca are of great value.

The animals of this sub-kingdom are divisible into the *molluscoids* and the true *mollusca*, the former being distinguished from the latter by the very low development of the nervous system, which is composed of only a single ganglion, giving off nerves in different directions, and by their propagating by gemmation. The molluscoids are divisible into: Class 1. POLYZOA or BRYOZOA. Examples—*Plumatella, Flustra.* Class 2. TUNICATA. Examples—*Ascidia, Salpa.* The true mollusca are divisible into: Class 3. BRACHIOPODA or PALLIOBRANCHIATA. Example—*Terebratula.* Class 4. LAMELLIBRANCHIATA. Examples—*Oyster, Mussel, Cockle.* Class 5. GASTEROPODA. Examples—*Snail, Cowry, Limpet, Doris.* Class 6. PTEROPODA. Examples—*Clio, Hyalea.* Class 7. CEPHALOPODA. Examples—*Cuttle-fish, Nautilus.* The distinctive characters of these classes are given in separate articles.

The literature of this subject is very extensive. Amongst the most important works on the mollusca generally may be mentioned Cuvier, *Mémoires pour servir à l'Histoire et à l'Anatomie des Mollusques avec* 35 *pl.* (Paris, 1817, 4to); Lamarck, *Hist. Nat. des Animaux sans Vertèbres*, 2d edit., par Deshayes et Milne-Edwards (11 vols. 8vo); Woodward, *Manual of the Mollusca;* and the third volume of Bronn's great work, published at Leipsic in 1864, entitled *Classen und Ordnungen des Thierreichs;* while for information on the mollusca of Great Britain, the reader is especially referred to Forbes and Hanley, *Molluscous Animals and their Shells* (4 vols. 8vo); Gosse, *A Manual of Marine Zoology for the British Isles;* and Alder and Hancock, *Nudibranchiate Mollusca* (published by the Ray society).

Fossil Mollusca.—The hard shells of most Mollusca fit them for long preservation, and make them the most frequent organic remains in the fossiliferous rocks from the Silurian upwards. The tunicata and the nudibranchiate gasteropods, having no hard parts that could be preserved, are without fossil representatives; the glassy and translucent fragile shell of the pteropoda is only known fossil from a few species in the tertiary strata; unless, indeed, the comparatively large forms (*connularia* and *theca*) from the older rocks have been rightly referred to this order. The remaining four orders—the cephalopoda, gasteropoda, brachiopoda, and lamellibranchiata—have existed together from the earliest period. The tetrabranchiate cephalopoda were developed in great profusion and variety in the paleozoic and secondary periods; and as they decreased, the dibranchiate group took their place, and continued to increase in numbers until it reached its greatest development in the seas of our own day. Of the chambered shells like the pearly nautilus, it is estimated that over 1400 species are known, of which only five or six exist in the ocean now; the cuttle-fishes and squids, on the other hand, are represented in the secondary and Tertiary rocks by about 100 species, while at least twice as many are known as living species.

The living gasteropoda exceed the fossil in the proportion of 4 to 3. This disproportion will appear greater when we remember that the fauna of the present seas is set against the faunas of some thirty different periods, yet it must not be forgotten that we can never be acquainted with more than a fraction of the entire animal life of any bypast age. Almost contemporaneous with the first living organisms, this group has gone on increasing to the present time, when the numbers are so great that more than 8,000 living species have been recorded. A genus of air-breathing univalves has been described by Lyell, from the coal-measures of Nova Scotia. A single species—a modern-looking *physa* —has been obtained from the Purbeck limestone, the newest of the secondary rocks. They are more frequent in tertiary beds.

The brachiopoda, or lamp-shells, like the nautilus group, have their history chiefly written in the rocky tablets of the earth. Of 1300 known species, only 75 are living, and these are comparatively rare, or are at least found in inaccessible localities, whereas, in some periods of the earth's history, as when the chalk and mountain limestone beds were being formed, and especially during the Devonian period, the individuals abounded to an enormous extent. The genus *lingula*, seven species of which live in the modern seas, can be traced through the intervening strata, down to the first fossiliferous bed, to which, indeed, it gives the name of "lingula bed;" but this species, though externally not to be distinguished from the existing shell, has a pedicel groove in the ventral valve—a character sufficient, perhaps, for the establishment of a different genus. Indeed, none of the genera of the paleozoic rocks still exist; the want of exact information is the only excuse for the continued application of the names of recent genera to the ancient inhabitants of the globe.

The conchifera have been gradually increasing in numbers and importance from the earliest period, and they attain their maximum development in the existing seas. The more simple forms, with an open mantle, are common in the paleozoic strata; the siphonated families, unknown in the older rocks, appear in considerable number in the secondary strata, and continue to increase upwards. The recent species number about 8,000, while the fossil are nearly twice as many.

MOLLUSCOIDA, a division of the sub-kingdom Mollusca (q. v.), also in the article INVERTEBRATE ANIMALS.

MOLL'WITZ, a village of Prussian Silesia, in the government of Breslau, seven m. w. of Brieg. Pop. 619. To the e. of it lies the celebrated battle-field where Frederick II. of Prussia gained his first victory over the Austrains under marshal Neipperg, April 10, 1741. According to the usual account, Frederick, on seeing his right wing and center thrown into confusion and routed, put spurs to his charger, and fled from the field; but the advance of three battalions of Prussian infantry stopped the Austrians, while by this time marshal Schwerin, who commanded on the Prussian left, routed the Austrian right wing, and compelled the whole to retreat. The Austrians suffered immense loss in killed, wounded, and prisoners. The immediate result of this victory was an alliance between France and Prussia, to dissolve which Austria was compelled to surrender the province of Silesia to Frederick, in 1742.

MOLLY MAGUIRES, a secret order which existed in 1854–77, and probably still exists, in the anthracite coal mining region of north-eastern Pennsylvania. Here 400 collieries employed 60,000 men; Americans, Germans, Welshmen, Englishmen, and Swedes comprising one-half the number, the remainder being Irish. Among the latter half originated, in the locality named, the order of Molly Maguires, a branch of the "ribbonmen" of Ireland. The order, however, had a much wider existence, and is alleged to have been affiliated with the "ancient order of Hibernians," elsewhere a peaceable and reputable organization. Until 1865 and '66 the order of Molly Maguires had not become generally known for the murders and other brutalities which then distinguished it. In 1875, having gained control of a combination which forced a general strike in the coal-regions, it succeeded in obtaining an ascendency in the councils of the miners, and from that period was prominent in assassinations and other outrages, committed usually on the persons and against the property of justices of the peace, police officers, and mining bosses. The number of murders increased between 1869 and '71, and fell off after the latter year, and until that of the great strike of 1875. According to some of those who made an investigation into the antecedents of the Molly Maguires, they originated in the trade-unions, and not in the A. O. H. or among the ribbonmen. None but Catholic Irishmen or their descendants were admitted to membership: the order was organized in divisions, each having a chief official known as a "body-master;" and there were signs and passwords to enable members to distinguish each other. These signs and passwords were given to the members by the body-masters, who received them from the county delegate, who got them from the state delegate, to whom they were furnished by the national delegate or national board in New York city: to the latter they came quarterly from Ireland, by the hands of the steward of one of the transatlantic steamships. A central and governing organization known as "The Board of Erin" was said to be the origination of the order, and this held quarterly meetings in England, Scotland, or Ireland. So extended were the ramifications of this order in Pennsylvania, that it was made known during the trials of the Molly Maguires in 1877 that one of their body-masters in the Pottsville district held the high office of county commissioner. The final exposure, capture, and punishment of the Molly Maguires was largely due to the energy and determination of Franklin B. Gowen, president of the Philadelphia and Reading railroad co. and coal co.; through the immediate instrumentality of James McParlan, a detective, who joined the Molly Maguires, became acquainted with their members and the secrets of their organization, and was at length enabled to afford information which disclosed the names of criminals connected with a majority of the murders committed by the order. A large number were apprehended, tried, and condemned, and their execution—that of a number of them occurring on the same day—so alarmed the members of the order that it ceased to possess any extended influence.

MOLO, a city of the Philippine islands, on an island of the same name, 4 m. from Iloilo. See PHILLIPINES. In ancient times, it was a Chinese colony, and is now occupied by Mestizos and their descendants, most of them having a mixture of Chinese blood. Pop. 16,000.

MOLOCH (more correctly MOLECH), also MILKOM, MALKOM (*their* king), from Heb. *Melech*, king, the chief Ammonite deity (the Chemosh of the Moabites), whose worship consisted chiefly of human sacrifices, purifications, and ordeals by fire, mutilation, perpetual virginity, and the like; practices specially inveighed against in the Mosaic records. Even the stranger who should devote his offspring to this idol was to be put to death by stoning. It is not quite certain which was the particular manner of this sacrifice. Rabbinical tradition represents Moloch as a human figure of brass or clay, with a crowned bull's head, upon whose extended arms were laid the doomed children. A fire within the hollow statue soon scorched them to death, while their shrieks of agony were deadened by a loud noise made by the priests upon various instruments. But although this description nearly coincides with that of the statue of the Carthaginian Kronos, and although so late a traveler even as Benjamin de Tudela speaks of having seen the remains of an ancient Ammonite temple at Gebal, with the fragments of an idol somewhat corresponding to the above representation, yet nothing certain is known about this point at present; nay, even the burning of the children itself has been questioned; and it is contended, yet without much show of reason, that the victims were merely carried through two pyres of fire by way of solemn purification or baptism. It seems, however, certain that the worship of Moloch, in whatever shape it may have been, was common throughout the Canaanite nations. The Carthaginians, through whom it was probably spread over the whole east, worshiped Kronos in rites of fire and bloodshed; and human beings, children or grown-up persons, prisoners or virgins, were, either on certain periodical festivals, or on sudden emergencies, offered up throughout almost all the lands and islands which the merchant-people of antiquity may be supposed to have touched at. The description of the Kronian statue, as given by classical writers, differs only in that small respect from the one given above, that the child fell, according to the former, from the hands of the god into a burning fire below, instead of being slowly burned to death. On fire worship in general, which is the main idea of "Moloch"—probably worshiped originally as the symbol of the sun—we have spoken under GUEBRES. The name itself gives no clew to its special nature, nor does any comparison with cognate roots lead any further. Molech, or Melech, is the supreme king or deity of the people, who have enthroned him as their tutelary god. Naturally, the princes of Ammon are the princes of *Malcham* = their (the Ammonites') king or god, and his priests were high in social rank.

Respecting the special history of this worship among the Israelites, we can only say that, although we do not see any more reason to presuppose its wide spread at early times (on account of the frequent occurrence of the word "king" in doubtful passages) than there is the slightest ground for assuming (as has been done by Daumer and others) that the whole Mosaic religion originated in a Moloch-service (a notion which hardly required a serious refutation for its instant explosion), yet there is no doubt that it had its secret, although few adherents, even before the Canaanite women in Solomon's harem reintroduced it publicly. The Valley of Hinnom and the Mount of Olives were the chief places of these abominable rites; the former being afterwards adopted as the name for hell, even in Islam. Not until the time of Josiah was it rooted out from among the people. The word has now become a designation for a kind of irresistible dread influence, at whose shrine everything would be sacrificed, even as the deluded father offered his own child to the terrible idol.

MO'LOCH, a genus of saurian reptiles, of the family *Agamidæ* (see AGAMA). *M. horridus*, an Australian species, is perhaps the most ugly and repulsive in appearance of all the saurian tribes. The whole surface of the body is covered with irregular plates and strong sharp spines; the upper surface of the head is crowned with two very large spines;

and on the back of the neck are large rounded protuberances, covered with granular scales and spines. The moloch is, however, a perfectly inoffensive creature.

MOLO'GA, a district t. in the w. of the government of Jaroslav, in European Russia, is situated near the confluence of the Mologa and Volga, 68 m. w.n.w. of Jaroslav. It is a town of great antiquity, and first belonged to the principality of Rostof, afterwards to Yaroslaf, but from 1321 till 1471 it had its own princes. There was formerly an extensive fair at Mologa. The timber-trade, and the carriage of goods by river-boats and rafts, now occupy the majority of the inhabitants. Pop. '67, 3,715.—The river Mologa is one of the links between the Volga and the Neva.

MOLOSSIA, or MOLOSSIS, a division of ancient Epirus, comprising the n.e. district. Its chief town was Ambracia. The country was famous, in ancient times, for its breed of shepherd dogs.

MOLOSSUS, a genus of bats (cheiroptera). The head and ears are large; hind limbs robust, giving the animal more power of running than most others of the order; tail long, enveloped at its base, but most frequently free at the extremity. It has a wide geographical distribution, in Africa, Asia, and South America, principally the two latter, in warm regions. Dental formula:

$$i\,\frac{1-1}{1-1};\ c\,\frac{1-1}{1-1};\ m\,\frac{5-5}{5-5}=28$$

MOLTKE, HELLMUTH, Count von, Field-marshal of the German empire, and chief of the general staff, who planned the Prussian campaign of 1866 against Austria, and the German campaign of 1870–71 against France. He belongs to an old family who had their seat for centuries in Mecklenburg, where Moltke was born, Oct. 26, 1800. Soon after his birth, his father, a military officer, left Mecklenburg and acquired an estate in Holstein. He and his brother were sent to the military academy in Copenhagen, where iron discipline and military frugality laid the foundation of his later character. In 1822 he entered the Prussian army as cornet. His parents having by this time lost all their fortune, he was left without any means whatever, and had to undergo many hardships to maintain himself in his position, from the very modest pay the Prussian officers receive; yet he managed to save enough to take lessons in modern languages, which afterward proved of great advantage to him. His eminent abilities soon procured him a place in the general staff. The time between 1835 and 1839 he spent in Turkey and Asia Minor, whither he was sent by the Prussian government to report on the war between that country and Mehemet Ali. Several anonymous publications of his, descriptive of the country and the war, are worthy of notice. After his return, he rapidly advanced through the different stages to the rank of general, continuing, however, on the general staff. His wonderful strategical powers were of immense service in the wars with Denmark (1863–64), Austria (1866), and France (1870–71); bringing them all to triumphant issues. At the end of the Austrian war he was rewarded with the order of the Black-Eagle, in 1870 he was created a count, and in 1871 he was raised to the rank of field-marshal. He published a work on the Franco-German war. Moltke is a man of great modesty and simplicity; he is reserved, and so little given to talk, that he has acquired the surname of "the Silent." The same composure and equanimity that he possesses in council, he also prererves in the heat of battle. See GERMANY.

MOLUC'CAS, or ROYAL ISLANDS, properly so called are Ternate, Tidore, Makian, Motir, and Batjan, lying to the w. of Gilolo, and washed by the Moluccas strait or passage, which separates Gilolo from Celebes.—Ternate, the most important, is a volcanic mountain with plains at its base. The top is in 0° 48' 30" n. lat., and 127° 26' 30" e. long. Area 33½ sq. miles. Pop. 8,594, of whom 109 are Europeans. The town is on the e. side and contains the sultan's palace, the Dutch residency, Protestant church, government school, etc. The island is fertile and well watered; the natives peaceful. They cultivate rice, cotton, tobacco, etc., trade with the adjacent islands, and build vessels, from the light skiff and the tent-boat to the war-galley of 60 or 80 rowers, carrying two or more pieces of light artillery.—Tidore is s. of Ternate, its n. point being 1° 11' n. lat., and 127° 7' e. long. Area 33 sq. miles. Pop. 8,157. The island is a volcano, 5,582 ft. high, and fertile for 3,000 feet. The natives are less gentle but more industrious than those of Ternate, and diligently cultivate the soil, weave, and fish. They are Mohammedans, and have many mosques. The sultans of Ternate and Tidore are subsidized by and subject to the Netherlands, exercising their authority under the surveillance of the resident.—Makian lies in 0° 18' 30" n. lat., and 127° 24' e. long., is very fertile, yields much sago, rice, tobacco, canary-oil, etc., and has important fishings. Pop. 5,000. The natives are industrious, make good nets, spin yarns, and weave coarse striped fabrics. Further n., in 0° 28' n. lat., and 127° 29' 30" e. long., is Motir, which formerly yielded a considerable quantity of cloves, and later sent much earthenware to all the Spice islands.

Batjan, the only remaining Royal island, lies between 0° 13' to 0° 55' s. lat., and 127° 22' to 128° e. long., is 50 m. in length, and 18 in breadth, has many mountain peaks from 1500 to 4,000 ft. in height, the sources of numerous rivers. The greatest part of this beautiful island is covered with ebony, satin-wood, and other valuable timber trees, which give shelter to numerous beautiful-plumaged birds, deer, wild hogs, and reptiles. Sago, rice, cocoa-nuts, cloves, fish, and fowls are plentiful, and a little coffee is cultivated. Coal is abundant, gold and copper in small quantities. The inhabitants, 1800, who are lazy and sensual, are a mixed race of Portuguese, Spaniards, Dutch, and natives. These islands are all volcanic, Ternate being a mountain, sloping upwards to 5,563 ft., to which Tidore bears a striking resemblance. Makian is an active volcano, which, so late as Dec., 1861, threw forth immense quantities of lava and ashes, by which 326 lives were lost, and 15 villages in part or in whole destroyed. Motir is a trachyte mountain, 2,296 ft. in height; and Batjan, a chain with several lofty peaks. Total population of the Moluccas proper, 28,551.

To the s.w. of Batjan lie the Obi group, consisting of Obi Major, Obi Minor, Typha, Gonoma, Pisang, and Maya, of which Obi Major, in 1° 25′ s. lat., and from 127° to 128° e. long., is by far the largest, having an area of 598 sq. miles. It is hilly and fertile, being covered, like the smaller islands of the group, with sago and nutmeg trees. They are uninhabited, and serve as lurking-places for pirates and escaped convicts. In 1671 the Dutch built a block-house, called the Bril; and a few years later the sultan of Batjan sold the group to them for $800; but the station being found unhealthy, the company abandoned it in 1738.

The **Moluccas**, or **Spice Islands**, in the broad use of the term, lie to the e. of Celebes, scattered over nearly 11 degrees of lat. and long., between 3° s. to 8° n. lat., and 126° to 135° e. long., including all the territories formerly ruled over by the sultans of Ternate and Tidore. They are divided into the residencies of Amboyna (q v.), Banda (q.v.), and Ternate; a fourth residency being Menado (q.v.). Over the northern groups of the Spice islands the Netherlands exercise an indirect government, the sultans of Ternate and Tidore requiring to have all their appointments of native officials ratified by the resident. The southern groups are directly under European rule. The residency of Amboyna contains that island, sometimes called Ley-Timor, or Hitu, from the two peninsulas of which it is formed, Buru, the Uliasser group, and the w. part of Ceram. That of Banda includes the Banda, Keffing, Key, Arru, and other islands, also the eastern portion of Ceram. Under the residency of Ternate are placed the Moluccas proper, Gilolo, the neighboring islands, and the n.w. of Papua. In 1871, pop. of the Moluccas and dependencies, 4,214 Europeans and 795,860 natives.

Amboyna, the Banda and Uliasser islands, chiefly supply the cloves, nutmegs, and mace which form the staple exports. The Banda islands are Neira or Banda-Neira, Great Banda, Ay or Way, Rhun, Rozingain, and Goenong-Api, containing an area of 588 sq. miles. In 1857, pop. 6,101, of whom 400 were Europeans; that of the whole residency, 110,302, including the eastern part of Ceram. The principal island of the group is Neira, s.e. from Amboyna, in 4° 33′ s. lat., and 130° e. long., separated by narrow straits from Goenong-Api on the w. and Great Banda on the east. The coast is steep, and surmounted by several forts and batteries, which command the straits and roadstead. The town of Neira, on the s. side of the island, is the capital of the Dutch residency of Banda, has a Protestant church, school, and hospital. The Banda islands have a rich soil, and are planted with nutmeg-trees, producing, in 1860, upwards of a million lbs. of nuts, and 275,586 lbs. of mace. The culture has nearly doubled since 1851. Pine-apples, the vine, banana, cocoa-nut, and other fruit-trees thrive, and are abundant. Ay is the prettiest and most productive of the group. Goenong-Api is a lofty volcano. There are wild cows, hogs, and deer; sea-carp and mackerel, which last are dried, and form with sago the food of the slaves. The e. monsoon begins in May, and the w. in December, and are accompanied with rain and storms. The climate is not particularly healthy.

The Uliassers, which, with Amboyna, produce the cloves of commerce, are Saparoua, Oma or Haroukou, and Nousa-Laut. They lie to the e. of Amboyna, in 3° 40′ s. lat., and 128° 33′ e. long., and have an area of 107½ sq. miles. Saparoua is the largest, and is formed of two mountainous peninsulas, joined in the middle by a narrow strip of undulating grassy land. Recently there were about 100,000 trees, producing 185,000 lbs. of cloves. The pop. amounts to 11,665, of whom 7,340 are Christians, and have 12 schools, with a very large attendance of scholars.—Oma, separated from Saparoua by a strait of a league in width, has 11 villages, of which Harouka and Oma are the chief. It is mountainous in the s., and has several rivers and sulphurous springs. The produce of cloves has amounted in one year to 40,000 lbs.; and the villagers possess 50,000 cocoa palms, besides other fruit-trees. The woods abound with deer and wild hogs, the rivers with fish. Sago is grown, but not in sufficient quantities to meet the wants of the people, who draw further supplies from Ceram. The beautiful village of Harouka, on the w. coast, is the residence of the Dutch postholder, who is president of the council of chiefs. Here is the head office of the clove-produce. There are two forts on Oma, several churches, and 6 schools, with 700 pupils. Pop. 7,188, one-half Christians, the other Mohammedans.—Nousa-Laut lies to the s.e. of Saparoua. It is planted with clove-trees, which in one year produced 120,000 lbs. There are upwards of 30,000 cocoa-nut trees. The inhabitants, who formerly were pirates and cannibals, amount to 3,479 souls, are all Christians, and have schools in every village—in 1859 they were attended by 870 pupils.

The clove-tree and the nutmeg are indigenous to all the Spice islands, but the clove-cultivation is confined to Amboyna and the Uliassers, the nutmeg to the Banda islands. Till 1824 the Dutch prohibited the planting of these trees in other parts, and caused those of native growth to be rooted out, in order to prevent smuggling, and to retain the supply of these spices to the European market. The Spice islands are generally healthy both for Europeans and Asiatics; and though the plains are sometimes very hot, mountains are always near, where it is pleasantly cool in the mornings and evenings. Besides the spice-trees, the bread-fruit, sago, cocoa-nut, banana, orange, guava, papaw, also ebony, iron-wood, and other valuable timber-trees, are abundant. The natives of some of the islands are Alfoers; of others, Malays on the coasts, and Alfoers in the interior. In Ceram are also Papuan negroes, brought originally from Bali and Papua as slaves.

The resident and other Dutch officials reside in the city of Amboyna, the streets of which are broad, planted with rows of beautiful trees, and cut each other at right angles. There are two Protestant churches, a town-house, orphanage, hospital, and theater, besides a useful institution for training native teachers, with which is connected a printing-press. Near the city are beautiful promenades and country-seats. Pop. 10,500.

In 1854 the clove-produce amounted to 580,592 lbs., the number of trees planted being 405,639, of which one-third part were fruit-bearing; nutmegs, 537,861 lbs., and mace, 133,986 lbs.; the trees planted being 424,573, of which 297,272 were bearing. The total cost of the nutmegs and mace delivered in the Netherlands that year was £30,768 sterling, realizing £94,436. In 1859 the Moluccas sent to Java for the account of government, 2,012 piculs of mace (the picul = 133 lbs.), 81,101 of cloves, 6,636 of nutmegs, and 28 of cocoa-nut soap; the value being £59,416. The produce of nutmegs, in 1851, was 463,309 lbs.; in 1859 it had risen to 832,634, and in 1860 to 1,044,657. The clove-crop varies much, as the following table will show: 1856, 617,250 lbs.; 1857, 187,093½; 1858, 233,518; 1859, 390,888; 1860, 258,117. Amboyna and Banda have been free ports since 1854; but as government monopolizes the labor, there is no fair competition, and the people are slaves of the soil, their chiefs being paid in proportion to the produce delivered.

In 1521 Antonio de Brito first appeared to take possession of the Moluccas in the name of the king of Portugal; and after a long period of violence, intrigue, and perfidy, the Portuguese were driven out by the Dutch and natives, at the beginning of the 17th century. The change was of no advantage to the natives, for the Dutch, having obtained the exclusive right of buying all the cloves, at a nominal value, a series of wars ensued, which resulted in the subjugation of the Spice islands. Recently, new sultans of Ternate and Tidore have been appointed, with less power than their predecessors; and the wars with the Alfoers of Ceram, in 1859 and 1860, have brought them more fully under Dutch rule.

MOLY, a fabulous plant, said to be a panacea for all diseases, given by Hermes to Odysseus as a protection against the magical charms of Circe. It was supposed to be a variety of garlic. There is a kind of garlic still called "sorcerer's garlic," probably a reminiscence of the Circe legend.

MOLYBDE'NUM (sym. Mo; equiv. 48—new system, 96; sp. grav. 8.62) is a rare metal, which, in a state of purity, is of a silvery white color, has a strongly metallic luster, is brittle, and very difficult of fusion. It never occurs native, and its principal ore is the bisulphide, which much resembles graphite. It is also occasionally found oxidized in molybdate of lead. The metal may be obtained by roasting the bisulphide in a free current of air, when the sulphur goes off oxidized as sulphurous acid, and the molybdenum is also oxidized into molybdic acid (MoO_3), and remains in the vessel. By the action of charcoal, the reduced metal is then obtained from the acid.

Molybdenum forms three compounds with oxygen—the protoxide (MoO), the binoxide (MoO_2), and molybdic acid (MoO_3). Of these three, the last alone has any practical value. Molybdic acid is a white, glistening, crystalline powder, which is almost insoluble in water, fuses at a red heat, and unites with bases to form well-marked salts, the molybdates, which are either colorless or yellow. A solution of molybdate of ammonia is one of the most delicate tests for phosphoric acid.

Molybdenum forms various compounds with sulphur, chlorine, etc., none of which are of any practical importance, except the native bisulphide.

MOLYNEUX, WILLIAM, LL.D., 1656–98; b. Ireland; educated at Trinity college, Dublin, and afterwards a member of the middle temple, London. He had been instructed in mathematics by his father, Samuel Molyneux, who had written a work on gunnery, and he soon turned his attention from law to mathematics and optics. He was one of the founders and the first secretary of the Dublin philosophical society. Two years later he was made a member of the London royal society, and was sent by the English government to examine the fortifications in the Netherlands. In 1688 he was forced to leave Ireland on account of the political troubles there, but he came back after the battle of the Boyne. In 1692 he represented the Dublin university in the Irish parliament. His main work, the first in English upon the subject, is a treatise on optics, called *Dioptrica*. This book was revised by Halley, who included in the appendix his theorem for finding the foci of optic glasses. He also published a *Translation of the Six Metaphysical Dissertations of Descartes*, and numerous papers in the proceedings of the royal society. One of his non-scientific works contains some interesting reminiscences of the war in Ireland—his *Journal of the Three Months' Campaign of his Majesty in Ireland*, 1690.

MOMBASSA, or MOMBAZ, a seaport t. of east Africa, in the territory of the sultan of Zanzibar, on a small coralline island off the coast, in the middle of an estuary formed by two small rivers, in lat. 4° 4′ s.. and long. 39° 43′ e., about 150 m. n. of Zanzibar island. The shores of the island are rocky and abrupt; and although the channel may be forded at low water, the attempt is attended with danger. The town has the usual Arab characteristics of ruin, neglect, and filth in a striking degree. The only object of interest is an extensive fort, built on a rock, cut perpendicularly, in 1596, by the Portuguese, and restored by them in 1635, as an inscription over the principal gateway indicates. It is a work of considerable pretension, with upwards of 100 guns in position, but in a ruinous condition. The inhabitants, the majority of whom are sunk in abject poverty, mostly live in wretched hovels, scattered among what remains of the once magnificent buildings. The town and island of Mombassa, as well as the surrounding district, is inhabited by the Wanika tribe. The harbor is still good, and is commodious and safe. Mombassa was visited by Vasco da Gama in 1497, when he found it to be a large and very prosperous town. It was held by the Portuguese during the greater part of the period from 1529 to 1720, when it appears to have become independent. The English held it from 1824 to 1826, when they resigned it. Since then it appears to have been possessed by the sultan of Zanzibar, and apparently is considered a place of some importance. Burton says that the inhabitants of Mombassa "are justly taxed with pride, bigotry, evil-speaking, insolence, turbulence, and treachery by other Arabs." Pop. 13,000 to 15,000.

MOMENT, of any physical agency, is its importance with reference to some special application. Thus, the moment of a force applied (perpendicularly) to a lever, is the importance of the force as regards turning the lever about its fulcrum. It is, as we know (see LEVER), proportional to the product of the force by the distance of its point of application from the fulcrum. The moment of a force about any axis (to which its direction is perpendicular) is the product of the force by its least distance from the axis; and a similar definition is laid down for moment of velocity and moment of momentum. It is easy to see (see MOMENTUM) that in any system of mutually acting bodies the moment of momentum about any axis remains constant, since the equal mutual forces measure the momentum transferred from one body to another, and the moments of these forces are in pairs equal and opposite. A particular case of this is Kepler's law, that each planet describes equal areas in equal times about the sun.

Moment of Inertia.—In the rotation of bodies round an axis, the moment of inertia is the sum of the products of each particle of the body into the square of its distance from the axis; or if M be the body, m_1, m_2, m_3, etc., the particles composing it, and r_1, r_2, r_3, etc., their corresponding distances from the axis, then the moment of inertia of M $= m_1r_1^2 + m_2r_2^2 + m_3r_3^2 +$, etc.; and if a quantity, k, be found such that $Mk^2 = m_1r_1^2 + m_2r_2^2 + m_3r_3^2 +$, etc., then k is called the *radius of gyration*. See CENTER OF GYRATION.

MOMENTUM, or QUANTITY OF MOTION, is defined by Newton as proportional to the mass moving, and its velocity, conjointly. If we assume unit of momentum to be that of unit of mass moving with unit of velocity, we shall evidently have, for the momentum of a mass M, moving with velocity V, the expression MV. And such is the unit generally adopted.

It is shown by experiment that, when force produces motion in any body, the momentum produced in one second is proportional to the force—and, in fact, *force is measured by the momentum it is capable of producing in unit of time*. Thus, the same force, if acting for one second on each of a number of bodies, produces in them velocities which are *inversely* as their masses. Also when, as in the case of falling bodies, the velocities produced in one second are the same in all, we conclude that the forces are *proportional* to the masses; and, in fact, this is the physical proof that the weight of a body is proportional to its mass. Again, if different forces act, each for a second, on the *same* mass, the velocities produced are proportional to the forces. All these are but different modes of statement of the experimental fact that force is proportional to the momentum it produces in unit of time; which forms a part of Newton's second law of motion.

When two masses act on each other, Newton's third law of motion (see MOTION, LAWS OF) shows that the forces they mutually exert are equal and opposite. The momenta produced by these must therefore be equal and opposite. Thus, in attraction or impact of two masses, *no momentum is lost;* since what is lost by one is gained by the other.

The momentum of a system of bodies can be resolved (as velocity is resolved) into components in any assigned directions, and the mutual forces of the system may be thus likewise resolved. Applying the previous result, we see at once that in any system of mutually acting bodies (such, for instance, as the solar system), no momentum is, on the whole, either gained or lost in any particular direction; it is merely transferred from one part of the system to another.

This fact, called the conservation of momentum, has caused great confusion in the minds of pseudo-physicists, who constantly confound it with conservation of work or energy, a totally different thing.

The momentum produced by force in any period of time is measured by the product of the force and the *time during which it has acted*—the energy or work done by a force is measured by the product of the force and the *space through which it has acted.* Momentum is proportional to the simple velocity of a body, and *can never, by any known process, be transformed into anything else.* Energy, when depending on velocity (see FORCE, CONSERVATION OF), is proportional to the *square* of the velocity, and is in the natural world *constantly being transformed from its actual or kinetic form to its potential form, and back again, or to some other kinetic form, such as heat, and finally must become heat.* Momentum, on the contrary, is never altered, either in kind or in amount.

In *knocking down* a wall, or in staving in the whole side of a ship, the battering-ram of the ancients (when constructed of sufficient mass, and worked by the proper number of men or animals) was probably nearly as effective as the best modern artillery. But in making a *breach* in a wall, or in punching a hole in the armor of an iron-clad, mere massive shot with low velocities (such as those of the Dahlgren guns), are comparatively ineffective, however great their momentum; while an Armstrong or Whitworth projectile, with a fraction of the momentum, but with greater velocity, and, for its size, much greater kinetic energy, effects the object with ease.

In many every-day phenomena, we see most distinctly the difference between these two affections of matter. Thus, a blow delivered from the shoulder by a *heavy* pugilist, even if it be sluggishly given, generally floors its man, without doing much other injury; but a sharp stroke administered by a light weight, while hardly disturbing the adversary's equilibrium, inflicts serious punishment.

MÔMIERS, French for maskers or comedians, is the name given in derision to a sect of evangelical Protestants of Switzerland and adjacent parts of Germany and France, who exhibited an uncommon degree of fervor in their religious services. They charged the national church with apostacy from the reformed faith especially by denying the divinity of Christ. This subjected them to opposition and restraint, so that ultimately, despairing of making progress, they went back to the church. The most distinguished man among them was the rev. Cæsar H. A. Malan, D.D., who having been brought up among Socinians continued to hold Socinian doctrines after his ordination as a minister in 1810, until in 1817, by means of friendly intercourse and discussion with Robert Haldane of Scotland and Dr. John M. Mason of New York, at that time sojourning at Geneva, he embraced evangelical doctrine, and was, 1820–1863, pastor of an independent congregation of Mômiers.

MOMMSEN, THEODOR, a distinguished writer on the history and polity of ancient Rome, was b. in 1817 at Garding, in Sleswick, where his father was a pastor in the Lutheran church. Mommsen studied first at Altona, and subsequently at the university of Kiel, where he graduated in arts in 1843. Having obtained some assistance from the academy of Berlin to defray the expenses of a prolonged course of travels, Mommsen spent three years in investigating Roman inscriptions in France and Italy, and from time to time published the result of his investigations in the annals of the archæological institute of Rome and the Herculanean academy of Naples. The political disturbances of 1848 diverted Mommsen from his favorite pursuits; and for a time he devoted himself to politics, taking upon himself the editorship of the leading Sleswick-Holstein paper, for which he wrote the leading articles in the summer or 1848. Mommsen held for a short time a chair in the university of Leipsic, but his appointment was canceled on account of his strong political tendencies. He was made titular professor of law at Zurich in 1852, and at Breslau in 1854; while, since 1858, he has filled the chair of Roman law at Berlin. His attention has long been devoted to those branches of archæology and ancient history with which his name is now so honorably associated. Among his most valuable contributions to these departments of knowledge, special mention must be made of the following: *Die Unteritalischen Dialekte* (Leip. 1850); *Corpus Inscriptionum Neapolitanarum* (Leip 1851); his mongraphs on *The Chronography of the Year* 354; and *Roman Coins* (Leip. 1850); the edict of Diocletian, *De Pretiis Rerum Venalium* A. 301 (Leip. 1851): *Inscriptiones Regni Neapolit.-Latinæ*, 1852; *Die Rechtsfrage Zwischen Cæsar und d. Senat*, 1857; his great work on Roman history, *Röm. Geschichte*, fifth edition, 1868–70 (ably translated into English by W. P. Dickson); *Römische Forschungen* articles on special points of Roman antiquities (1st vol. Berlin, 1864); *Römisches Staatsrecht* (1st. vol. Leip. 1871); *Die Erzählung von Caius Martius Coriolanus;* and his *Digesta Justiniani Augusti* (Berlin, 1868–70).

MOMOR'DICA, a genus of plants of the natural order *cucurbitaceæ*, having lateral tendrils, and the fruit splitting when ripe. *Momordica balsamina*, a native of the south of Europe and of the east, produces a curious, oblong, much-warted fruit, called the BALSAM APPLE, which, when green, is infused in oil, to form a vulnerary much esteemed in Syria and some other countries. The ripe fruit is a dangerous poison. The plant is used to form arbors.—The large, red, thorny fruit of *momordica mixta*, called *gol-kakra* in India, is there used for food.—*Momordica echinata* is called the *gooseberry gourd*, because its fruit, which is covered with bristles, is about the size and shape of a large gooseberry. The unripe fruit is used for pickling, and is sometimes to be seen in Covent Garden market.

MOMOT or MOTMOT, the common name for the different species of birds belonging to the genus *prionites* of Illiger. Some have placed the momot as a genus, and it has also been proposed as a family. Its place is, however, rather uncertain. It has been assigned to the coraciadæ. The genus *prionites* has the following characteristics. Both mandibles slightly curved and compressed; the margins with strong denticulations; tongue long and slender, with the sides ciliated; wings short and rounded; tail long and pointed. Dr. G. R. Gray makes the momotinæ, a sub-family of the *todidæ*, consist of the genus *crypticus* (prionites of Swainson), and the genus *momotus* (prionites of Illiger, momota of Shaw, and rhamphastos of Linnæus).

MOMOTOM'BO, a volcano of the Marabios range, near lake Managua, 25 m. n.e. of Leon in Nicaragua. Its height is 7,200 ft., of which more than one-third is composed of the ashes and cinders ejected in past ages. It is still active, but has had no serious eruptions for many years. Among other traditions connected with it is one, embodied in Victor Hugo's *La Légende des Siècles*, which tells of an attempt by Spanish priests to ascend and plant the cross on its summit; they were never heard of afterwards; and the ascent remains to this day unaccomplished.

MOMPOX', a t. of the United States of Colombia, on the Magdalena, 110 m. s.e. of Cartagena. Here the Magdalena, during its periodical floods, rises 12 or 15 ft. above its usual level; and the quay and custom-house of Mompox are built unusually high, in order to provide against this emergency. All the foreign goods destined for the consumption of the valley of the Magdalena pass through this town. Pop. estimated at 10,000.

MOMUS, in fabulous history, the god of raillery, or the jester, who ridiculed both gods and men. He is the personification of mocking censure. Being requested by Vulcan, Neptune, and Minerva, to give his opinion as to their works, he blamed them all: Neptune, for not making his bull with horns before his eyes, in order to give a surer blow; Minerva, for building a house which could not be moved in case of bad neighbors; Vulcan, for making a man without a window in his breast, that his secrect thoughts might be seen. Venus alone was blameless. For his free censures of the gods he was expelled from heaven. He is generally represented as raising a mask from his face, and holding a small figure in his hand. He is according to Hesiod the progeny of Night.

MON'ACHISM (Gr. *monachos*, a monk, from *monos*, alone) may in general be described as a state of religious retirement more or less complete, accompanied by contemplation, and by various devotional, ascetical, and penitential practices. It is, in truth, asceticism (q.v.), with the element of religious solitude superadded. The institution of monachism has, under different forms, entered into several religious systems, ancient and modern. That it was known among the Jews before the coming of our Lord, appears from the example of the prophet Elias, and from that of the Essenians; and it is probable that religious seclusion formed part of the practice of the Nazarites (q.v.), at least in the later periods of Jewish history. In the Brahmanical religion, it has had a prominent place; and even to the present day, the *lamaseries* of Thibet may be said to rival in number and extent the monasteries of Italy or Spain. The Christian advocates of monachism find in the gospel exhortations to voluntary poverty (Matt. xix. 21) and to celibacy (1 Cor. vii. 37), at once the justification and the origin of the primitive institution. Its first form appears in the practice of asceticism, of which we find frequent mention in the early part of the 2d century. The primitive ascetics, however, lived among the brethren, and it is only in the following century that the peculiar characteristic of monachism begins to appear. The earliest form of Christian monachism is also the most complete—that already described under the head Anchorites (q.v.); and is commonly believed to have in part originated in the persecutions, from which Christians were forced to retire into deserts and solitary places. The anchorites maintained from choice, after the cessation of the persecutions, the seclusion to which they had originally resorted as an expedient of security; and a later development of the same principle is found in the still more remarkable psychological phenomenon of the celebrated Pillar-saints (q.v.). After a time, however, the necessities of the religious life itself—as the attendance at public worship, the participation of the sacraments, the desire for mutual instruction and edification—led to modifications of the degree and of the nature of the solitude. First came the simplest form of common life, which sought to combine the personal seclusion of individuals with the common exercise of all the public duties; an aggregation of separate cells into the same district, called by the name *Laura*, with a common church, in which all assembled for prayer and public worship. From the union of the common life with personal solitude is derived the name *cenobite* (Gr. *koinos bios*, common life), by which this class of monks is distinguished from the strict solitaries, as the anchorites or eremites, and in which is involved, in addition to the obligations of poverty and chastity, which were vowed by the anchorites, a third obligation of obedience to a superior, which, in conjunction with the two former, has ever since been held to constitute the essence of the religious or monastic life. The first origin of the strictly cenobitical or monastic life has been detailed under the name of Saint Antony (q.v.), who may be regarded as its founder in the east, either by himself or by his disciples So rapid was its progress, that his first disciple, Pachomius (q.v.), lived to find himself the superior of 7,000. In the single district of Nitria, there were no fewer than 50 monasteries (Sozomen, *Eccles. History*, vi. 31), and before long, the civil authorities judged it expedient to place restrictions on their excessive multiplication. It seems to be admitted, that, in the east, where asceticism has always been held in high estimation, the example of Christian monasticism had a powerful influence in forwarding the progress of Christianity; although it is also certain that the admiration which it excited occasionally led to its natural consequence among the members, by eliciting a spirit of pride and ostentation, and by provoking, sometimes to fanatical excesses of austerity, sometimes to hypocritical simulations of rigor. The abuses which arose, even in the early stages of monachism, are deplored by the very Fathers who are most eloquent in their praises of the institution itself. These abuses prevailed chiefly in a class of monks called *Sarabaitæ*, who lived in small communities of three or four, and sometimes led a wandering and irregular life. On the other hand, a most extraordinary picture is drawn by Theodoret, in his *Religious Histories*, of the rigor and mortification practiced in some of the greater monasteries. The monks were commonly zealots in religion; and much of the bitterness of the religious controversies of the east was due to that unrestrained zeal; and it may be added that the opinions which led to these controversies originated for the most part among the theologians of the cloisters. Most famous among these were an order called *Acœmetæ* (Gr. sleepless), from their maintaining the public services of the church day and night without interruption. See MONOPHYSITES, MONOTHELISM, NESTORIANS, IMAGE-WORSHIP.

It was in the cenobitic rather than the eremetic form that monachism was first introduced into the west, at Rome and in northern Italy by Athanasius, in Africa by St. Augustine, and afterwards in Gaul by St. Martin of Tours. Here also the institute spread rapidly under the same general forms in which it is found in the eastern church; but considerable relaxations were gradually introduced, and it was not until the thorough reformation, and, as it may be called, religious revival effected by the celebrated St. Benedict (q.v.), in the beginning of the 6th c., that western monachism assumed its peculiar and permanent form. In some of the more isolated churches, as, for instance, that of Britain, it would seem that the reformations of St. Benedict were not introduced until a late period ; and in that church as well as in the church of Ireland, they were a subject of considerable controversy. One of the most important modifications of monachism in the west, regarded the nature of the occupation in which the monks were to be engaged during the times not directly devoted to prayer, meditation, or other spiritual exercises. In the east, manual labor formed the chief, if not the sole external occupation prescribed to the monks; it being held as a fundamental principle, that for each individual the main business of life was the sanctification of his own soul. In the west, besides the labor of the hands, mental occupation was also prescribed, not, it is true for all, but for those for whom it was especially calculated. From an early period, therefore, the monasteries of the west, and particularly those of Ireland, or of the colonies, founded by Irish monks, as Iona and Lindisfarne, became schools of learning, and training-houses for the clergy. At a later period, most monasteries possessed a *scriptorium*, or writing-room, in which the monks were employed in the transcription of MSS.; and although a great proportion of the work so done was, as might naturally be expected, in the department of sacred learning, yet it cannot be doubted that it is to the scholars of the cloister we owe the preservation of most of those among the master-pieces of classic literature which have reached our age.

In the remarkable religious movement which characterized the church of the 12th c. (see FRANCIS OF ASSISI, FRANCISCANS), the principle of monachism underwent a further modification. The *spiritual egotism*, so to speak, of the early monachism, which in some sense limited the work of the cloister to the sanctification of the individual, gave place to the more comprehensive range of spiritual duty, which, in the institute of the various bodies of friars (q.v.) which that age produced, made the spiritual and even the temporal necessities of one's neighbor equally with, if not more than, one's own, the object of the work of the cloister. The progress of these various bodies, both in the 12th c. and since that age, is detailed under their several titles. It only remains to detail the later history of monachism, properly so called. The monastic institutes of the west are almost all offshoots or modifications of the Benedictines (q.v.); of these, the most remarkable are the Carthusians, Cistercians, Grandmontines, Clugniacs, Premonstratensians, and above all Maurists, or Benedictines (q.v.) of St. Maur. In more modern times, other institutes have been founded for the service of the sick, for the education of the poor, and other similar works of mercy, which are also classed under the denomination of monks. The most important of these are described under their several heads.

The inclosure within which a community of monks reside is called a monastery (q.v.) —Gr. *monasterion*, Lat. *monasterium*. By the strict law of the church, called the law of cloister or inclosure, it is forbidden to all except members of the order to enter a monastery; and in almost all the orders, this prohibition is rigidly enforced as regards the admission of females to the monasteries of men. To such a length is this carried in the Greek church, that in the celebrated inclosure of Mount Athos, not only women, but all animals of the female sex are rigorously excluded. The first condition of admission to a monastic order is the approval of the superior, after which the candidates remain for a short time as *postulants*. After this preliminary trial, they enter on what is called the *novitiate*, the length of which in different orders varies from one to three years; and at its close, they are admitted to the profession, at which the solemn vows are taken. The age for profession has varied at different times and in different orders; the council of Trent, however, has fixed 16 as the minimum age. Originally, all monks were lay.

men; but after a time, the superiors, and by degrees other more meritorious members, were admitted to holy orders. The distinction of priest-monks and lay-brothers has been already explained under the head FRIAR: but in both alike, where the order is one of those solemnly approved by the church, the engagement taken at the final profession is life-long and irrevocable.

The monastic institute, from the very earliest time, embraced women as well as men. The former were called in Greek by the name *nonis* or *nonna*, and in Latin *nonna* (from which the English *nun*), as also *sanctimonialis*. The cloistered residence of nuns is called by various names, as NUNNERY, CONVENT, a name also applied to the houses of men. The general characteristics of the monastic institute for females are substantially identical with those of the male orders; and as the principal varieties of institute are detailed under their respective heads, it is needless to particularize them here.

It is hardly necessary to say that the reformed churches in the 16th c. discarded the practice of monachism, and suppressed the monastic houses. In some of the German states, the temporalities of the suppressed monasteries were retained, and were granted at pleasure by the sovereign, to be enjoyed together with the titular dignity. Some of the German churches, however, in later times, have revived the institute both for men and for women, as has also been done in the Anglican church both in the time of Laud and in our own day. In all these Protestant revivals of monachism, however, the engagement is revocable at the will of the individual. At the French revolution, the monastic establishments of France were utterly suppressed; and in most of the other Catholic countries of Europe the example has been followed to a greater or less extent. In England and Ireland and America, on the contrary, the institute has made rapid progress within the last 20 years. Most of the orders, however, introduced into these countries are of the active rather than the contemplative class.

MO'NACO, a small principality of Italy, on the coast of the Mediterranean sea, a few miles n.e. of the city of Nice. The climate is fine, so that oranges, lemons, etc., are produced in abundance. Pop. '73, 5,741. From the 10th to the 18th c. Monaco was held by the Genoese family of Grimaldi. In 1815 it was ceded to Sardinia, which, however, recognized its independence, but reserved to itself the right of garrisoning the town of Monaco. At this period it consisted of three communes—Monaco, Mentone, and Roccabruna, with an area of 52 sq.m., and a pop. of about 7,000. In 1848 Mentone and Roccabruna were annexed to Sardinia, in spite of a protest by his "serene highness," Carlo Honorio, third prince of Monaco. The Italian war of 1859 placed the whole territory for a brief period under Victor Emmanuel; but Carlo Honorio having sold Mentone and Roccabruna (Feb. 2, 1861) to the French emperor for 4,000,000 francs, Sardinia was obliged to renounce her hold upon them. The sovereign prince of Monaco now possesses nothing but the city and a small patch of territory, with a total area of 6 sq.m.; pop. '73, 5,741. The town is a beautiful place on a rocky promontory, with 2,667 inhabitants.

MO'NAD (Gr. *monas*, unity), a term borrowed from the Peripatetic philosophy, although employed by moderns in a sense different from that of the Peripatetics, who used it to designate the universe, understood in the pantheistic sense. By moderns, and especialy by Leibnitz (q.v.), from whose system alone the name has derived importance, it is used to describe the primary elements of all matter. The monads are simple uncompounded substances, without figure, without extension, without divisibility, by the aggregation of which all bodies are formed, and into which all compounded things may ultimately be resolved. The monads are created things, but as being uncompounded, are indestructible; and although subject to change, the change is but external or relative. They are of two classes—the first are destitute of consciousness, although possessing an internal activity which is called by the name of perception; the second possess, in addition to perception, a certain consciousness, which is called by the name "apperception" or conscious-perception. The monads of this class are souls, and according to the degree of their consciousness is the distinction between the souls of the higher and those of the lower intelligences. The Deity is the PRIME MONAD, or MONAD OF MONADS. The theory of monads enters largely into the philosophic system of Leibnitz, and indeed furnishes the key to much in that system which is otherwise obscure.

MONAD. *Monas*, the generic name of many kinds of microscopic organisms, very minute, and supposed also to be of very simple organization. They appear, even under a powerful microscope, as mere points, moving rapidly through the fluid in which they exist, and often becoming aggregated in clusters; or they are seen to be gelatinous and globular, or nearly so, with a tail or thong-like filament, by the vibrations of which they move. When the fluid is tinted by means of some harmless coloring matter, the existence of several cells or vesicles is discerned within the minute body. Ehrenberg, therefore, classed them among polygastric infusoria (see INFUSORIA), and no naturalist doubted their right to a place, although one of the lowest, in the animal kingdom. They are now universally regarded as vegetable, and are ranked among algæ. The organisms formerly known as globe animalcules (*volvox*) are clusters of monads produced by gemmation from one, and invested with a common envelope. Monads are of various colors. Their gemmation takes place according to fixed laws, so that the groups assume particular forms, characteristic of the different kinds. Thus, in the "breast-plate animalcule" (*gonium pectorale*), so called from the form which the group frequently presents, a division takes place into four, and the number in a group is always either four or sixteen, a group of sixteen always dividing into four parts, each of which contains four monads.—The minute moving points often seen under the microscope are probably often not monads, but spores or germs.

MONADNOCK, Grand, a mountain in the s.w. corner of New Hampshire, which from a base of 5 by 3 m. rises to a height of 3,450 feet. It is composed of talc, mica, and slate, can be seen from the state house at Boston, and is a landmark at sea. Thirty lakes, some containing numerous islands, can be seen from its summit.

MONA'GAS, José Tadeo, 1786-1868; b. Venezuela; served under Bolivar in the war of independence, 1810-20. After a number of unsuccessful attempts to overthrow the government, he was chosen to the presidency in 1846. He sent ex-president Paez, against whom he had formerly headed a revolution, into exile, and abrogated the constitution, making himself dictator. He succeeded in maintaining himself in this office till 1859. He declared against and overthrew the government of gen. Falcon in 1868, and was again elected to the presidency, but died before taking his seat.

MONAGHAN, an inland co. of the province of Ulster, Ireland, situated between Tyrone on the n., Armagh and Louth on the e., Meath and Cavan on the s., and Fermanagh on the west. Its greatest length from n. to s. is 37 m.; its greatest breadth e. and w. is 28; the total area being 500 sq.m., or 319,757 acres, of which 285,885 are arable. The population, which in 1861 was 126,340, had fallen in 1871 to 114,970. The general surface is undulatory, the hills, except in the n.w. and e., being of small elevation, although often abrupt; the highest point does not exceed 1254 ft. above the sea. It is interspersed with lakes of small extent, and for the most part of little depth, and, although the streams are numerous, there is no navigable river within its boundaries. In its geological structure the level country belongs to the great central limestone district; the rest is of the same transition formation which is met with in the northern tract of Leinster. No minerals are found in a remunerative quantity; there is a small coal-field in the southern border, but it has not been found profitable to work. The soil is very varied in its character, and for the most part is wet and imperfectly drained, although commonly capable of much improvement; but in general it is found suitable for the production of cereal crops (with the exception of wheat, which is little cultivated), and of flax. The total area under crops in 1876 was 139,739 acres. There were 60,569 acres under oats, and 12,204 acres under flax. The cattle in the same year numbered 85,569; sheep, 15,999; pigs, 32,056. The annual valuation of property in 1874 was £262,432. Monaghan is well supplied with good roads, and is connected by railway with Dublin, Belfast, and Galway, and directly with the coast at Dundalk. The Ulster canal passes through the county. The principal towns of this county are Monaghan (q.v.), Carrickmacross, Clones, and Castle-Blayney. It returns two members to parliament, the constituency being, at the enumeration of 1873, 5,608. Monaghan, at the invasion, formed part of the grant of Henry II. to De Courcey, and was partially occupied by him; but it speedily fell back into the hands of the native chiefs of the sept MacMahon, by whom (with some alternations of re-conquest) it was held till the reign of Elizabeth, when it was erected into a shire. Even still, however, the authority of the English was in many places little more than nominal, especially in the north; and in the rising of 1641 the MacMahons again resumed the territorial sovereignty. The historical antiquities of the county are of little interest or importance. It possesses two round towers, one very complete, at Clones, the other at Inniskeen; and there are many remains of the ancient earth-works commonly referred to the ante-English period. The total number of children attending the superior and primary schools in the county of Monaghan during 1871 was 12,749, of whom 8,586 were Roman Catholics.

MONAGHAN, chief t. of the county of the same name, is situated on the great north line from Dublin to Londonderry, distant from the former 76 m. n.n.w. Pop. in '71. 3,632. Monaghan, before the union, was a town of some importance, having a charter from James I., and returning two members to the Irish parliament. It is still the center of an active inland trade, and can boast some public buildings of considerable pretensions, among which are the jail, market-house, and court-house. A Roman Catholic college and a cathedral dedicated to St. Mac Carthain also deserve special notice. The general market is on Monday; three markets for agricultural produce are held weekly, and there is also a monthly fair.

MONARCHIANS, "believers in one fountain or source of being," were persons in the early Christian church who did not admit a distinction of persons in the divine Being. Believing strictly in the unity of God, they rejected the orthodox doctrine of the trinity. Traces of their opinions appeared at a very early period of the Christian era, and are alluded to by Justin Martyr as held both by Jews and Christians. He condemns the former for saying that when God communed with the patriarchs it was God the Father who appeared. He makes the same complaint against certain Christians. From this it is manifest that in Justin's day there were nominal Christians, who spoke of the Son as only an unsubstantial energy of the Father. This leading opinion of the monarchians is thought to have been brought into Christianity chiefly through Alexandrian Jews and Gnostics, or, in some instances, to have been derived directly from pagan philosophy. From pagan religion it could not have come, unless very indirectly, as that took little thought of the unity of God. But whatever its origin, it was embraced by two classes, who differed greatly in their application of the theory: the one, who may be called rationalistic, admitted the divinity of Christ only as being at most a mere power; the other, some of whom were *Patripassians*, identified the Son with the Father, and allowed at most only a trinity of manifestation. "The one," says Schaff, "prejudiced the dignity of the Son, the other the dignity of the Father; yet the latter was by far the more profound and Christian, and accordingly met with the greater acceptance." 1. Those of the first class saw in Christ a mere man filled with divine power; but conceived this divine power as present in him not merely from his baptism, but from the beginning, and admitted his supernatural conception through the Holy Ghost. 2. The second class, whom Tertullian called *Patripassians*, while they professed Unitarian opinions, strove also to hold fast the divinity of Christ; and, as they thought, accomplished their object by merging his independent personality in the essence of the Father. Sabellius, about the middle of the 3d c., denying both trinity of essence and permanent trinity of manifestation, taught that the unity of God, without distinction in itself, after the creation, unfolds itself in the course of the world's development in three different forms and periods of revelation, and after the completion of redemption, returns into unity. The Father (he said) reveals God in the giving of the law and the Old Testament economy; the Son reveals God in the incarnation; and the Holy Ghost reveals God in inspiration. He illustrated this trinity of relations by comparing the Father to the sun, the Son to its enlightening power, and the Spirit to its warming influence. Athanasius pointed out coincidences of thought in the stoic philosophy with the doctrine of Sabellius, which, however, is generally admitted to have been thought out independently in his own mind. He may be regarded as the most original, ingenious, and profound of the monarchians. His system has been revived by Schleiermacher in a very modified form; and is substantially held in still later times by some who, holding to Christ's supreme divinity, deny the union in him of the human and divine natures, and suppose that he was God dwelling in human flesh and subject to its limitations and infirmities. It will be seen that the general principle of monarchianism admits various modifications in theory, and may be pressed in one extreme into a denial of any proper divinity in Christ, and in the opposite extreme to a position scarcely distinguishable from the standard doctrine which has been upheld in the church. See INCARNATION, TRINITY.

MONARCHY (Gr. *monarchia*, from *monos*, alone, and *archō*, to govern; literally, the government of a single individual) is that form of government in a community by which one person exercises the sovereign authority. It is only when the king, or chief magistrate of the community, possesses the entire ruling power that he is, in the proper acceptation of the term, a monarch. Most of the oriental governments past and present, Russia at present, and Spain and France as they were in the last century, are in this strict sense monarchies. The degenerate form of monarchy is tyranny, or government for the exclusive benefit of the ruler. When the head of the state, still possessing the status and dignity of royalty, shares the supreme power with a class of nobles, with a popular body, or with both, as in our own country, the government, though no longer in strictness monarchical, is called in popular language a mixed or limited monarchy, the term absolute monarchy being applied to a government properly monarchical. The highest ideal of government would perhaps be attained by an absolute monarchy, if there were any security for always possessing a thoroughly wise and good monarch; but this condition is obviously unattainable, and a bad despot has it in his power to inflict infinite evil. It therefore becomes desirable that a governing class, composed, if possible, of the wisest and most enlightened in the country, should share the supreme power with the sovereign. A limited monarchy has this advantage over an aristocratic republic that, in difficult crises of the nation's existence, royalty becomes a neutral and guiding power, raised above the accidents and struggles of political life.

Monarchy, most usually hereditary, has sometimes been elective, a condition generally attended with feuds and distractions, as was the case in Poland. The elective system is still followed in the choice of the pope. Constitutional monarchy may be in its origin elective, or combine both systems, as when one family is disinherited, and the scepter declared hereditary in the hands of another under certain conditions. See KING, REPUBLIC.

MONASTERY has been described under the head of Monachism (q.v.) as the generic name of the residence of any body of men, or even, though more rarely, of women, bound by monastic vows. It may be useful, however, to detail the various classes of monastic establishments of the western church, and to point out the leading characteristics of each. The name, in its most strict acceptation, is confined to the residences of monks, properly so called, or of nuns of the cognate orders (as the Benedictine), and as such, it comprises two great classes, the *abbey* and the *priory*. The former name was given only to establishments of the highest rank, governed by an abbot, who was commonly assisted by a prior, sub-prior, and other minor functionaries. An abbey always included a church, and the English word *minster*, although, like the cognate German *münster*, it has now lost its specific application, has its origin in the Latin *monasterium*. A *priory* supposed a less extensive and less numerous community. It was governed by a prior, and was originally, although by no means uniformly, at least in later times, subject to the jurisdiction of an abbey. Many priories possessed extensive territorial domains, and of these, not a few became entirely independent. The distinction of abbey and priory is found equally among the Benedictine nuns. In the military orders, the name of *commandery* and *preceptory* corresponded with those of abbey and priory in the monastic orders. The establishments of the mendicant, and, in general, of the modern orders, are sometimes, though less properly, called monasteries. Their more characteristic appellation is *friary* or *convent*, and they are commonly distinguished into *professed houses* (called also *residences*), *novitiates*, and *colleges*, or *scholastic houses*. The names of the superiors of such houses differ in the different orders. The common name is *rector*, but in some orders the superior is called *guardian* (as in the Franciscan), or *master*, *major*, *father superior*, etc. The houses of females—except in the Benedictine or Cistercian orders—are called indifferently *convent* and *nunnery*, the head of which is styled *mother superior*, or *reverend mother*. The name *cloister* properly means the inclosure; but it is popularly used to designate, sometimes the arcaded ambulatory which runs around the inner court of the building, sometimes, in the more general sense, of the entire building, when it may be considered as synonymous with *convent*.

MONASTIR', Toli-Monastir, or Bitolia, a t. of European Turkey, capital of the vilayet named after it, is situated in a broad valley of the Niji mountains, 90 m. n.n.e. of Janina, and about the same distance w.n.w. of Saloniki. It is an important place, is the residence of the governor-general, and commands the routes between Macedonia and northern Albania. The inhabitants are mostly Greeks and Bulgarians. Monastir has 11 mosques, and carries on a large trade with Constantinople, Saloniki, Vienna, and Trieste. From Constantinople alone it annually buys goods to the value of £1,500,000. Its bazaars, containing more than 2,200 shops, are well stocked with the products of western Europe and the colonies, as also with native manufactures. Yet it is one of the worst built and most tasteless towns in all Turkey. Pop. 34,000.

MONASTIR, a seaport t. of north Africa, in the dominion of Tunis, 80 m. s.s.e. of the city of that name, on the gulf of Sidra. Woolen and camlet fabrics are manufactured, and there is some maritime trade. Pop. 12,000.

MONBODDO, James Burnet, Lord, a Scottish lawyer and author, was b. at Monboddo, in Kincardineshire, in 1714, educated at Marischal college, Aberdeen, where he displayed a great fondness for the Greek philosophers, and afterwards studied law for 3 years at Groningen, in Holland. In 1737 he became a member of the Scottish bar, and soon obtained considerable practice; but the first thing that brought him prominently into notice was his connection with the celebrated Douglas case, in which Mr. Burnet acted as counsel for Mr. Douglas. In 1767 he was raised to the bench by the title of lord Monboddo. He died May 26, 1799. Monboddo's first work, on the *Origin and Progress of Language* (1771–76), is a very learned, heretical, and eccentric production; yet in the midst of its grotesque crotchets there occasionally flashes out a wonderfully acute observation, that makes one regret the distorted and misapplied talent of the author. The notion that men have sprung from monkeys, is perhaps that which is most commonly associated with the name of Monboddo, who gravely asserted that the orang-outangs are members of the human species, and that in the bay of Bengal there exists a nation of human creatures with tails, and that we have only worn away ours by sitting on them, but that the stumps may still be felt. Monboddo wrote another work, entitled *Ancient Metaphysics*, which was published only a few weeks before his death.

MONBUTTOO, a country in central Africa, between 3° and 4° n. lat., and 28° and 29° e. long.; 4,000 sq.m.; estimated pop. '70, 1,000,000. It is an elevated table-land, 2,500 ft. above the sea. The Keebaly and Gadda rivers flow through it, uniting to form the Welle, which, after a westerly course through s. Nyam-Nyam, joins the Shary, the source of lake Tchad. The soil spontaneously produces so many fruits and edible roots that cultivation is small, restricted for the most part to tobacco, sugar cane, and sesame. There are few domestic animals. The inhabitants are lighter colored than the surrounding nations; they are cannibals, fond of the chase, and skillful in the working of copper, iron, and wood. Polygamy and circumcision are practiced. The art of weaving is unknown. There is a considerable trade in ivory.

MONCÁDA, Don Francisco de, Conde de Osona, an historian and one of the Spanish classics, b. Dec. 29, 1586, at Valencia, where his grandfather was then viceroy. Descended from one of the greatest families of Catalonia, he rapidly rose to the highest offices in the state, was ambassador to Vienna, and latterly governor of the Netherlands, and commander-in-chief of the Spanish troops there. He distinguished himself both as a statesman and a soldier. He fell at the siege of Goch, a fortress in the duchy of Cleves, in 1635. His *Historia de la Expedicion de Catalones y Aragoneses contra Turcos y Griegos* (Barcelona, 1623, and frequently reprinted), is a masterpiece in liveliness and elegance of style.

MONCALIE'RI, a t. of Italy, in the province of Turin, situated finely on the slope of a hill, on the right bank of the Po, 5 m. above Turin. Pop. 3,030. Moncalieri is the first railway station between Turin and Genoa, and communicates daily with Turin by frequent omnibuses; it has fine buildings, including a palace lately embellished for the residence of king Victor Emmanuel. The annual cattle-fair held in October at Moncalieri is the most important of the north of Italy.

MONCK, a co. in s. Ontario, on lake Erie; 378 sq.m.; pop. 16,189. The Canada Southern, the Grand Trunk, and the Great Western railroads pass through it.

MONCK, CHARLES STANLEY, Viscount, b. Ireland, 1819; educated at Trinity college, Dublin, and called to the Irish bar in 1841. He was elected to parliament as a liberal member for Portsmouth in 1852, and re-elected in 1855, but was unsuccessful in 1857. He was a lord of the treasury from 1855 to 1858, and was appointed governor-general of Canada in 1861. He was reappointed in 1867, but resigned the next year. In 1871 he served on the Irish national education commission, and on the commission to carry out the act for the disestablishment of the Irish church. He succeeded his father as viscount in the Irish peerage in 1849, and was made a viscount in the peerage of Great Britain in 1866.

MONCREIFF-WELLWOOD, Sir HENRY, 1750–1827; b. Scotland; son of the rev. sir William Moncreiff, and assumed the additional name of Wellwood late in life. Having been educated at Glasgow and Edinburgh, he was ordained, 1771, as successor to his father at Blackford, and continued there until 1775, when he became minister of St. Cuthbert's, Edinburgh. Always a member of the evangelical party in the church, he became at length its leader. His published works are: *Discourses on the Evidence of the Jewish and Christian Revelations; The Life and Writings of Dr. John Erskine;* and *Sermons*, 3 vols.

MONCTON, a t. in Canada, province of New Brunswick, co. of Westmoreland, the terminus of the Moncton to St. John's division of the Intercolonial railway; pop. 4,810. It is a port of entry, with a convenient harbor, very pleasantly located at the head of navigation of the Petitcodiac river, which empties into Chignecto bay, the n. extremity of the bay of Fundy. It has several hotels, 4 churches, a variety of stores, and a telegraph office. It contains the offices of the Intercolonial railway and repair shops. It has 2 banks, and its leading industries are the manufacture of steam-engines, machinery, cigars, leather, hardware, and castings. It has a great trade in lumber.

MONDAY (Ger. *Montag*, Lat. *Lunæ Dies*, the day of the moon, Fr. *Lundi*), the second day of the week. The name descends from the Romans, who named the days of the week after the planets.

MONDOÑE'DO, a t. in Galicia, Spain, n.n.e. of Lugo; pop. 2,452. It has a cathedral and a castle. There are tanneries, and manufactures of cotton cloth, and linen.

MONDO'VI, an episcopal t. in Cuneo, one of the northern provinces of Italy, situated on the summit and shoulder of an Alpine hill, 50 m. s. of Turin. It is divided into four sections: the piazza—encircled by walls, and containing the chief buildings of the place, and the suburbs, Carassone, Breo, and Piano del Valle. In the neighborhood considerable activity exists in cloth, silk, and bonnet-straw manufactories; but in spite of vineyards and chestnut woods, the numerous remains of ruined buildings in its vicinity impart an air of desolation to the locality. The Piazza contains a fine cathedral, with rich paintings; an episcopal palace, with a noble gallery of portraits; and the various judicial and educational halls. Pop. 12,800. At the battle of Mondovi, on April 22, 1796, the Sardinians were totally defeated by Bonaparte, and the entrance into Piedmont secured to the French army. The province of Mondovi is intersected by spurs of the Alps, and contains rich marble quarries and valuable mineral products.

MONE'SIA BARK, the bark of a tree, *chrysophyllum glycyphlæum*, or *C, Buranheim*, of the same genus with the star apple (q.v.), a native of the s. of Brazil. The bark is lactescent; but when dried, it is thick, flat, compact, heavy, brown, and hard, with a taste at first sweet, afterwards astringent and bitter. A substance called *monesia* is extracted from it, which is almost black, at first sweet, then astringent, and finally acrid. It is used as a stomachic and alterative in leucorrhœa, chronic diarrhœa, etc. It contains, in small quantity, a principle called *monesin*.

MONETARY COMMISSION OF THE U. S. CONGRESS. The mistaken demonetization of silver by congress in the coinage act of Feb. 12, 1873, passing almost unnoticed during that year, soon afterwards attracted the attention of thoughtful men. Its possible consequences loomed portentously into view, as the subject was more and more studied. Within three years it became a theme of general discussion in the United States. It was a prolific source of debate in the 44th congress; and on Aug. 15, 1876, the senate initiated a joint resolution for the appointment of a joint commission of three senators, three members of the house, with experts, not exceeding three, to be selected by the former, whose duty was to inquire, "First, Into the change which has taken place in the relative value of gold and silver; the causes thereof, whether permanent or otherwise; the effects thereof upon trade, commerce, finance, and the productive interests of the country, and upon the standard of value in this and foreign countries: Second, Into the policy of the restoration of the double standard in this country; and, if restored, what the legal relation of the two coins, silver and gold, should be; Third, Into the policy of continuing legal-tender notes concurrently with the metallic standards, and the effect thereof upon the labor, industries, and wealth of the country; Fourth, Into the best means for providing for facilitating the resumption of specie payments."

The commission as organized consisted of Messrs. John P. Jones, Lewis V. Bogy, and George S. Boutwell, of the senate; Randall L. Gibson, George Willard, and Richard P. Bland, of the house of representatives; Wm. S. Groesbeck of Ohio, and Prof. Francis Bowen of Massachusetts. Geo. M. Weston of Maine was appointed secretary. The sessions of the committee were held in New York until December of that year, and afterwards in Washington. Circulars were immediately issued by the commission to men of eminence in monetary studies, to authors, bankers, and business men in the United States and Europe, to elicit the widest possible information on the topics of the resolution. The chambers of commerce in the cities were invited to furnish, and did furnish, lists of persons most competent to give information. The U. S. representatives in foreign countries were required to aid in the work. The commission entered upon its duties with energy. collected vast stores of information, and were aided by the most eminent political economists and financial writers of all schools, who were glad to have such an opportunity for the elucidation and comparison of their views. The main substance of the report was submitted and ordered to be printed Mar. 2, 1877. It is a masterly condensation of the philosophy and facts bearing on money questions; embracing clear statements of all schools of opinion. The conclusions of the commission were not unanimous. But the majority report not only exhibits such grasp of the whole subject, but has also been so far proved correct in its deductions by facts which have since become a part of monetary history, that the several dissents of individual members of the committee from certain parts of the majority report are not of much importance. On the whole, the report is the most valuable compendium of facts and monetary theories ever published. It takes rank in point of ability with the famous bullion report of England in 1810, but covers a far wider field, and introduces social science problems in connection with the money question not taken into consideration by the British committee. The latter sifted financial questions from bankers' points of view: the U. S. commission reviews the subject in the light of the public weal—the greatest good to the greatest number.

The conclusions of the majority of the committee on the first questions submitted are: That the recent production of silver relatively to gold has not been greater than formerly; that the (then) recent fall in the price of silver was not caused by any recent large production; but mainly by the concurrent demonetization of silver in Germany, the United States, and the Scandinavian states, the closure of the mints of Europe to its coinage, the temporary diminution of the Asiatic demand, the exaggeration of the actual and prospective yield of the Nevada silver mines, and a prevailing idea that the efforts of holders of government securities would bring about its demonetization: that gold is more fitful in production than silver; that the average production of both is more steady than of either one; "that to annihilate the money function of one must greatly increase the purchasing power of the other, and greatly reduce prices;" that "silver to the amount of $3,000,000,000 in coin, the accumulation of 50 centuries, is so worked into the web and woof of the world's commerce that it cannot be discarded without entailing the most serious consequences, social, industrial, political, and commercial;" that "the evil is enormously aggravated by selecting gold as the metal to be retained and silver as the metal to be rejected;" that "the exchanges of the world, and especially of this country, are continually and largely increasing, while the supplies of both the precious metals, taken together, if not diminishing are at least stationary, and the supply of gold, taken by itself, is falling off; and that to submit the vast and increasing exchanges of this country and the world to be measured by a metal never to be depended on in its supply, and now actually diminishing in its production, would make crisis chronic, and business paralysis perpetual." Covering the second question the commission recommend the restoration of the double standard and the unrestricted coinage of both metals. The report on the third question for solution refers to the answer to the fourth, viz.: "the best means for providing for facilitating the resumption of specie payments." To this question the report answers, that "the remonetization of silver is a measure essential to specie payments, and may make such payments practicable." The commission believe "that the remonetization of silver in this country will have a powerful influence in preventing, and probably will prevent, the demonetization of silver in France and other European countries;" that remonetization by the United States, even without change in legislation elsewhere, will draw to us silver from other countries while it is cheap, in exchange for what we have to export; and that this country will have the benefit of the rise which the committee believe will take place in its value when the temporary causes of its depression have passed. The report concludes with these words: "If the states of the Latin union, or other countries in Europe, abandon the double standard after we re-adopt it, or because we re-adopt it, it will be a policy on their part through which great advantages will inure to us, and great disasters will befall them. It would inaugurate in the United States an era of prosperity, based upon solid money, obtained on profitable terms, and under circumstances necessarily stimulating to our industry and commerce."

"Finally, the commission believe that the facts that Germany and the Scandinavian states have adopted the single gold standard, and that some other European nations may possibly adopt it, instead of being reasons for perseverance in the attempt to establish it in the United States, are precisely the facts which make such an attempt entirely impracticable and ruinous. If the nations on the continent of Europe had the double standard, a gold standard would be possible here, because, in that condition, they would freely exchange gold for silver. It was that condition which enabled England to resume specie payments in gold in 1821. The attainment of such a standard becomes difficult precisely in proportion to the number and importance of the countries engaged in striving after it; and it is precisely in the same proportion that the ruinous effects of striving after it are aggravated. To propose to this country a contest for a gold standard with the European nations is to propose to it a disastrous race, in reducing the price of labor and commodities, in aggravating the burdens of debt, and in the diminution and concentration of wealth, in which all the contestants will suffer immeasurably, and the victors even more than the vanquished."

Mr. Boutwell alone makes a minority report against remonetization of silver, except on a previously agreed basis, adopted in conjunction with European nations. Prof. Francis Bowen expresses his dissent from the conclusions of the majority of the committee at much length; and, while he argues for the gold basis alone, he finally reports in favor of the remonetization of silver, on adding to the quantity of pure silver in a dollar enough to make its bullion value equal to the then value of gold per dollar, and also recommends the reduction of the value of our gold coins, so that a five dollar piece shall be the equivalent of the English pound sterling. He also recommends that the paper money of the government should be gradually taken up by the treasury department and destroyed. In addition to the summary of the report, the first volume, as issued by the government, embraces papers prepared for the commission by Geo. M. Weston on "Asiatic trade and flow of silver to the East;" "Constitutional powers of Congress and the States with respect to metallic money;" "Legislation on subsidiary silver coins;" and "The trade dollar." The appendix to the same volume contains a report on silver production in the United States; the world's production of gold and silver; relative value of gold and silver; population and specie in the western world; demonetization of silver in Germany; payment of French indemnity of 1871; movement of specie to India; standard of the United States; coinage of the United States; money standard for Great Britain; monetary system of Austria-Hungary and China: also, papers furnished by all the foreign ministers of the United States. The second volume contains written and oral answers by men of eminence in monetary science, and by those of great experience in business, both in the United States and Europe, in reply to a series of questions agreed upon by the commission. Among the citizens of this country from whom written answers were drawn were Henry C. Carey, John A. Dix, Henry S. Fitch, August Belmont, John J. Bennett, Barclay & Livingston, Royal Phelps, W. L. Fawcett, O. D. Ashley, R. M. Waters & Co., Samuel Hoard, W. G. Sumner, Wm. E. DuBois, Albert Miller, J. K. C. Forrest, B. F. Nourse, F. P. Knight, Robert Patterson. Among foreigners who responded were G. B. Airy, Francis Jourdan, Hector M. Hay, Ernest Seyd, E. de Parieu, and Henri Cernuschi. The oral testimony was from a large number of distinguished Americans, and is very interesting.

MONETARY CONFERENCE, International: Paris, Aug., 1878. The profound interest awakened in the United States and Europe from 1867 to 1878 by the legislation of various countries to demonetize and remonetize silver, and to restrict and to expand the coinage; the discussions on the subject of a single metal, or of two metals, as the wiser and safer basis of value of the world's money,—induced the United States congress, in the act which remonetized silver, Feb. 28, 1878, to insert the following: "Sec. 2. That immediately after the passage of this act, the president shall invite the governments of the countries composing the Latin union, so-called, and of such other European nations as he may deem advisable, to join the United States in a conference to adopt a common ratio between gold and silver, for the purpose of establishing, internationally, the use of bi-metallic money, and securing fixity of relative value between those metals; such conference to be held at such place in Europe or the United States, at such time within six months, as may be mutually agreed upon by the executives of the governments joining in the same, whenever the governments so invited, or any three of them, shall signify their willingness to unite in the same." The section further provides that the president shall appoint three commissioners to the conference. Ex-Governor Reuben E. Fenton of N. Y., Wm. S. Groesbeck of Ohio, and prof. Francis A. Walker of New Haven, were appointed. Subsequently the president was authorized to add to the list of delegates Mr. S. Dana Horton, of Ohio, an accomplished monetary student and author. Paris was chosen as the place of conference. Austria-Hungary, Belgium, France, Great Britain, Greece, Italy, the Netherlands, Russia, Sweden-Norway, and Switzerland sent their ablest representatives. The German government alone declined to participate in the conference, though a second time invited.

The conference opened its session Aug. 10, 1878, at the office of the ministry of foreign affairs. Leon Say, minister of finance in France under the presidencies of Thiers and McMahon, son and grandson of the most eminent of French writers on political economy, was made president of the conference, and Mr. Fenton vice-president. In his opening address to the conference Mr. Say stated the reasons which had induced the five states composing the Latin union "while preserving to silver its legal tender quality, to restrict its coinage within narrow limits, and, within the past year, to suspend it entirely." These reasons were the adoption by Germany of the single standard of gold, and the great production of the American silver mines. While Germany continued to gather and sell her silver he thought it would be difficult to determine the value at which silver might be rated when that disturbing element in its present value was out of the way. The Latin union, therefore, while glad to join in the American efforts to fix a ratio of value between silver and gold, "as a measure of prudence has remained in an expectant attitude." Mr. Fenton then presented the object of the call for the conference in the language of the act of congress. Count Rusconi of the Italian delegation suggested as more logical to first decide whether such a fixed ratio was possible. Mr. Say observed that as questions of fact should precede those of theory he would favor an avoidance of theoretical discussion at present, and first study facts and their relations. The first session closed with the understanding that the delegations should come to the next meeting prepared with full statistics of the monetary condition of their respective states. At the second session—Aug. 16—all the required documents were submitted. A brief summary of the position taken by the delegates at the subsequent sessions will best exhibit the animus of the conference. Mr. Broch, representative from Norway, observed that as Sweden and Norway had the gold standard they could participate in the conference only on the supposition that the United States desired to treat of more general questions; as of a coin for universal circulation. On that supposition only, and with the understanding that England was present on the same condition, his government had authorized participation in the conference. Mr. Groesbeck was called upon to state the position of the United States. It was, he said, simply "to restore silver to its former position; to equalize gold and silver upon a ratio to be fixed by agreement." The United States delegation could not commit their country to any agreement, but, like the delegates from Norway and Sweden, were interested to discuss the question of the establishment of coin for universal circulation. He corrected the supposition that the United States desired the full restoration of silver because it was the great silver producing country. He denied that in its legislation to preserve silver as money the United States had been influenced by the value of its present product of silver; the government having no direct interest, even by taxes, in the product; stating that the mines are owned indiscriminately by Americans and foreigners; and that London is so much the greater market for silver that the Unites States treasury had found itself compelled to buy as much silver in London as in America. He stated that within 25 years the yield of gold in the United States had been four times as great as that of silver, and that the falling off in production at the present time was more in silver than in gold. The remonetization of silver he showed to be on the part of the United States simply a return to a traditional policy with which the interests of the people are interwoven, and from which it was through careless legislation, rather than by design, that they had departed; and that therefore the United States could not be charged with a new motive of selfishness in its maintenance.]

Mr. Groesbeck submitted the following propositions to the conference: "1. It is the opinion of this assembly that it is not to be desired that silver should be excluded from free coinage in Europe and the United States of America. On the contrary, the assembly believe that it is desirable that the unrestricted coinage of silver and its use as money of unlimited legal tender should be retained where they exist, and. as far as practicable, restored where they have ceased to exist. 2. The use of both gold and silver as unlimited legal tender money may be safely adopted. First, by equalizing them at a relation to be fixed by international agreement; and secondly, by granting to each metal at the relation fixed, equal terms of coinage, making no discrimination between them." Mr. Pirmez of Belgium rejected the American propositions on behalf of his delegation. Count Rusconi of Italy desired first to discuss and vote on the principle, Is it possible to establish a fixed relation between silver and gold? He desired to vote affirmatively on that proposition first, and then proceed with the practical examination of a ratio. Mr. Broch of Norway, which has the gold standard, maintained that the history of silver showed a constantly decreasing value relatively to gold, and that during the enormous influx of gold from California and Australia after 1849 gold had dropped but 2 per cent below the French silver standard. Mr. Herzog of Switzerland opposed the American proposition; not that he desired silver demonetized, but that he thought it better for one nation to have the gold, and another the silver unit as now; and did not believe in the practicability of an international unit.

At the opening of the third session Mr. Goschen of England, and Mr. Mees of the Netherlands, questioned the American delegates concerning the certainty of resumption of specie payments the coming January. The statements in reply drew from Mr. Goschen the remark that there was no doubt of the ability of the United States to resume, and that his question had been put to enable him to form a judgment of the extent to which the United States might become buyers of silver in the world's markets. The U. S. treasury statement, he said, showed an exceedingly small holding of silver compared with gold. Mr. Groesbeck stated that, were an international agreement concluded on the American basis, the United States would absorb for the benefit of Europe not merely its own production, but a part of the German silver. Mr. Goschen called attention to the fact that "the United States invited the delegates to adopt a proposition which some of them were precluded by their instructions from entertaining," as they could not vote to compromise the existing standards of their countries; but "there was one part of the American propositions for which almost all the delegates could vote; and for which as a principle, personally, he would willingly subscribe, viz., that it is not desirable that silver cease to be one of the money metals. . . . Though England had a gold standard she had great interest in the maintenance of silver as currency. She had a more defined and less compromised position for the discussion of this question than other countries, for she had borne the depreciation of silver in India without trying to shut her doors upon it. She had done more than any other country to maintain silver. The Latin union had shut its doors upon silver. Holland half shut hers, while England had allowed it to take its natural course, and for five years had borne all the burdens resulting therefrom. Mr. von Henglemüller of Austria-Hungary could subscribe to the propositions of the United States, but since the advantage of this system depended upon the general adoption of it, his government was compelled to maintain an attitude of expectancy. As a member of the conference he would pronounce for the double standard. Mr. Mees of the Netherlands said that while England and Germany maintained the gold standard no other was possible for his country, but he could express his personal opinion that "it would be most beneficial to mankind that many states should adopt the double standard." He believed that in the Dutch colonies they would find it to their interest to maintain the silver standard. He agreed with Mr. Goschen that if the double standard were utopian, the single gold standard was also, and one that would be very dangerous if by some possible combination of circumstances it should be realized. He suggested that the United States unite with South America and Asiatic nations on silver, and then come to Europe with their proposition. Mr. Baralis of Italy thought that upon some points there was such a harmony of views that, if the precise propositions of the United States could not be adopted, at least some measure of utility closely allied to them might be. He did not sympathize with the advice to the delegates of the United States to seek allies in South America and China; and thought that the nations of Europe could now join in some practical affirmation in the direction of the propositions of the United States. Leon Say explained the monetary policy of France of late years as having the double standard in theory, but not in practice, the privilege of free coinage of silver at the mint having been withdrawn. When this suspension of free coinage first took place the question was warmly discussed in the French chambers whether it was a step towards the gold standard, or a provisional condition, which would permit France to avail itself of a favorable moment for returning to the double standard. The government declared emphatically that the movement was *not* towards the single gold standard. France is in "a condition of expectancy, from which we shall not move except for good reasons, when they show themselves, and then, probably, to re-enter into the system of the double standard." He stated that there were in the bank of France and in circulation in France 2,500,000,000 francs in silver; and that "to withdraw the legal tender power from such a mass of money, and to throw it on the market as merchandize is an inadmissible idea." He thought that until Germany had finished her sales of silver, France would remain in an attitude of expectancy. The proposition of the United States at the present moment seemed to him premature; and as its rejection by a majority would lead to a false conclusion as to the opinions of those at this time voting against its propositions as a whole, he suggested that they should not be passed upon, but that the states represented should agree simply upon the expression of a common idea as to the employment of silver as money, and should invite each other reciprocally not to take any measures in their domestic legislation which might depreciate silver. In his opinion, encouragement of the use of silver money will soon increase its value. He expressed assent to the first paragraph of the American proposition. He believed France might some day join the United States, assenting to the rest of their propositions; but not now. Mr. Feer Herzog of Switzerland announced himself energetically for the single gold standard; not for all nations, but "for the advanced nations, and leave silver to countries whose civilization is backwards or stationary." He announced that, with the Netherlands, Switzerland would maintain the "attitude of expectancy" with the hope of seeing the single gold standard eventually adopted by all. Count Rusconi of Italy was glad to see the general harmony of views on the necessity of continuing the monetary use of silver; and believed there was no difficulty in squarely admitting the fundamental propositions of the Americans. He believed further that when an international agreement as to legal ratio was arrived at, it alone would produce the equality desired; that "nature makes the metal, but law alone makes the money." Mr. H. H. Gibbs, ex-governor of the bank of England, announced himself a partisan of the gold standard, but would not legislate to drive silver out of use. He expressed entire dissent from the notion of Mr. Herzog that the fall of silver was in the ratio of the progress of civilization, by which the most progressive will use the most precious metal, and the less civilized will be content with the other. He believed the recent fall of silver entirely the result of a simultaneous action of many temporary causes, and that the action of Germany was an important factor in the result. He illustrated the greater effect produced on the market by the German mass of coins put up for sale than by any ordinary increase or decrease of production: lessening the use of silver, and at the same time glutting the market with it. The third session of the conference closed the first expressions of opinion volunteered by delegates from European nations on the American propositions.

The fourth session of the conference was opened by prof. Francis Walker in a remarkably vigorous address in support of the American propositions, and in refutation of the objections made to them. He maintained that down to 1873 silver had been the principal money of the world, and the sole money of many prosperous nations; that it had ceased, to whatever extent, to be money, not as the result of natural causes, but by action distinctly political—the laws and decrees of governments; that it is no reversal of any law of nature that the American delegates propose, but the reversal of recent works of men's devising in opposition to the natural economic forces which gave silver its position as money. "As," said he, "the conference of 1867, wholly absorbed in the consideration of the means of securing international coinage, did exert a powerful influence in initiating the movement for demonetizing silver, it remains for the conference of 1878, with a more sober judgment, and a larger view of human interests, instructed as the nations have been by the bitter experience of the past few years, to put forth its hand to stay the progress of that demonetization which has already brought such mischiefs upon trade and the production of wealth." Mr. S. Dana Horton of the American delegation followed in further defense of the American propositions. He analyzed and refuted with masterly comprehensiveness the objections, both as to the principles involved, and the fitness of the present time for their application. He re-stated the essential point to which the American delegates desired to confine the discussion, viz., "Is it in the interest of the states represented at this conference to continue to wage a monetary war by seeking, to each other's prejudice, to get rid of the falling metal; or, is it their interest to unite together in order by a common legislation to give to the monetary basis of the business world a stability which it does not now possess?" These speeches of Messrs. Walker and Horton exhibited a masterly famillarity with principles, with law, and with monetary history in all its relations, and were at the same time so aggressively decisive in their maintenance of the American propositions that the majority of the conference, opposed to them from the beginning, showed a plain inclination to put an end to discussion by a decisive vote and an adjournment. But a more generous courtesy prevailed, and the discussion was continued at a sixth session, at which Mr. Groesbeck presented a remarkably clear and condensed summary of the situation which no abstract can fairly present. At its conclusion Mr. Pirmez of Belgium undertook to meet the American presentation of the subject. Fluent, ingenious, and somewhat satirical, he made a good speech; but it was like the firing of small arms against a massive fortification. Mr. Horton's response left no standing ground for the other side except what the astute president Say had announced at the opening session, viz., that theoretically we may be with you, but practically *not now.* Mr. Horton, in conclusion, reviewed the points gained by the development of national policies in the conference, especially by the new and broader position assumed by England, claiming that, "independently of any other result, this much has already been gained: that the conference of 1878, breaking with the traditions and doctrines of 1867, will have inaugurated a new era in the history of monetary science in our time, and that it will a in manner fix the date of the decline of the theories of mono-metalism." The response of the delegates of European states was then submitted. It is as follows:

"The delegates of the European states represented in the conference desire to express their sincere thanks to the government of the United States for having procured an international exchange of opinion upon a subject of so much importance as the monetary question. Having maturely considered the proposals of the representatives of the United States, they recognize:

"1. That it is necessary to maintain in the world the monetary functions of silver as well as those of gold, but the selection for use of one or the other of the two metals, or of both simultaneously, should be governed by the special position of each state or group of states.

"2. That the question of the restriction of the coinage of silver should equally be left to the discretion of each state or group of states, according to the particular circumstances in which they may find themselves placed; and the more so in that the disturbance produced during the recent years in the silver market has variously affected the monetary situation of the several countries.

"3. That the differences of opinion which have appeared, and the fact that even some of the states which have the double standard find it impossible to enter into a mutual engagement with regard to the free coinage of silver, exclude the discussion of the adoption of a common ratio between the two metals."

The animus of this very courteous, but not quite satisfactory response, is evident. France, at the head of the Latin union, holds the balance of power between gold and silver. Recognizing the equal money power of each metal, and conscious of the value of her own astuteness in the use of the power of the Latin union she does not care to abandon that advantage for any humanitarian or commercial advantage to any association of nations. Her "attitude of expectancy" has an eye on Germany and England, and as her monetary legislation has been based on a clearer insight into the philosophy of monetary science than that of other countries, as proved by its practical results, the preservation of the right of independent action, untrammeled by agreements for co-operation, gives her a vantage ground for national aggrandizement through the financial blunders of other nations.

Messrs. Rusconi and Baralis of Italy at the sixth session, entered a protest against the response of the majority of the European delegates as follows:

"1st. That by the adoption of the formula proposed, the conference does not respond to the question which was put to it, and that in systematically avoiding to pronounce itself upon the possibility or impossibility of a fixed relation, to be established by way of international treaty, between coins of gold and silver, it leaves its task unfinished.

"2d. That since the French law established such a relation (1785) between the two metals, the oscillations of their relative value had been without importance, whatever had been the production of the mines.

"3d. That consequently, *a fortiori*, if the law of France had been alone able to accomplish the result, then on the day when France, England, and the United States, by international legislation, should agree to establish together the relation of value of the two metals, this relation would be established upon a basis so solid as to become unshakable."

Mr. Goschen, on the part of England, desired it to be distinctly understood that the adhesion of himself and colleagues to the response was because it *did not* pronounce for a double standard; and that he desired with equal distinction "to combat the theory of the economists who demand the universal adoption of the single gold standard—a measure which, in his view, might be the cause of the greatest disasters." Mr. De Thoerner, the Russian delegate, expressed a decided adherence to the single standard of his country—gold, and desired the response construed to mean nothing outside of its exact language. Count Von Kuefstein of Austria, said that "in presence of the explanations which had been given, from which might be inferred an admission of the impossibility of an international agreement for the double standard, he felt himself obliged to declare that if he adhered to the formula proposed by the European delegates, it was precisely because in his view it did not exclude the idea that such an arrangement was possible."

The practical work of the conference closed with the reading of the following rejoinder, signed by the four American delegates, to the response of the European delegates:

"The representatives of the United States regret that they cannot entirely concur in all that has been submitted to them by a majority of the representatives of European states. They fully concur in a part of the first proposition, viz., that 'it is necessary to maintain in the world the monetary functions of silver as well as those of gold,' and they desire that ere long there may be adequate co-operation to obtain that result. They cannot object to the statement that 'the selection for use of one or the other of these two metals, or of both simultaneously, should be governed by the special position of each state;' but if it be necessary to maintain the monetary functions of both metals, as previously declared, they respectfully submit that the special positions of states may become of but secondary importance.

"From so much of the second proposition as assigns as a special reason for at present restricting the coinage of silver, 'that the disturbance produced during the recent years in the silver market has differently affected the monetary situations of the several countries,' they respectfully dissent, believing that a policy of action would remove the disturbance that produced these inequalities.

"In regard to the third and last proposition, they admit that 'some of the states which have the double standard,' or, as they prefer to say, use both metals, 'find it impossible to enter into a mutual engagement for the free coinage of silver.' They, as representatives of the United States, have come here expressly to enter into such an engagement. The difficulty is not with them; and wherever it may be, they trust it may soon be removed.

"They entirely concur in the conclusion drawn from this state of the case, that 'it excludes the discussion of the question of the adoption of a common ratio between the two metals.' It is useless to agree upon a ratio between the two metals if the nations are not ready also to adopt a policy to uphold it. We remain upon ours; the European states upon theirs."

From the beginning to the end it was evident that the little countries embraced with France in the Latin union had special interests to protect that made the broader views and leaning of the American delegates obnoxious to them. England, on the other hand, took a position at the conference that exhibited all the largeness of view that comes of imperial interests in all parts of the world. Favoring a silver unit on one side of the globe and a gold unit on the other, she hopes by the skill of her commercial transactions between the opposite parts to profit by the two different standards, rather than by the joint-standard. What part of the membership of the conference represented the views of great banking houses rather than the interests of peoples, it would be difficult to determine: but that those interests are always likely to be too largely represented in such national conferences is evident. That Belgium and the Netherlands should have a vote in the conference equal to that of England, France, or the United States, is an absurdity. That little Switzerland, under the shadow of France, should be the sole determined advocate of the single gold standard was simply amusing. Yet her vote was half that of the United States. The effect of wide national diversity of interests was clearly seen in the broader views of those who represented the broader interests. The American delegates were conspicuous at the conference in this, and still more in the thoroughness of their intelligence, and the humanitarian scope of their aims.

The report of this monetary conference, prepared by Mr. S. Dana Horton, secretary of the American delegation, forms vol. 5 of the executive documents of the United States, printed by order of the senate in the third session of the XLVth congress. 1878–79. In addition to the journal of the proceedings of the conference, and a collection of the monetary papers and statistical tables submitted by each delegation, it contains a large variety of relevant matter of English and American legislation on money, with classic treatises and reports on monetary questions. Besides these it republishes entire the proceedings of the first monetary conference held in Paris, June, 1867; the whole forming a volume of 918 pages.

MONETARY TREATY OF PARIS, 1865. See LATIN UNION.

MONEY, in political economy. This is a word in continual use all over the civilized world, and perhaps there is none the meaning of which in connection with the business they have in hand is more distinctly understood by those who use it; and yet, on the other hand, there is none of which it is more difficult to give a comprehensive account or a strict definition. Presuming, then, that every one knows the practical use of the word in the affairs of common life, the best thing to be done here will be to point out a few distinctions which may tend to obviate confusion in the comprehensive use of the term as an element in economic science.

Money is often spoken of loosely as the same thing with capital, but they are different. Before anything is money, it must be such that you can go into the market and immediately use it in purchasing commodities or paying debts. The plant of a railway and the machinery of a mill, so long at they are in full use, are capital, and are capital which probably has once been money—but they are money no longer, because you cannot use them in making payments, though they have perhaps become more valuable than ever they were. The confusion of capital with money was the mistake made in issuing the French assignats on the security of the forfeited landed estates. Each assignat was a promise to pay; but when payment was demanded, it could not be made, because land was not a medium for making it. It is of the essence of money, then, that it is capable of making immediate payment either to satisfy a seller or a creditor. But an article may be money though it will not satisfy everbody; and articles available as money—even those most universally accepted as such—are available for other purposes. What we are familiar with as the most approved form of money—as the thing that will be most certainly received in payment all over the world—is coin of the precious metals. The reason why the claim of these is so universally accepted is, that they do not merely represent value, as we shall find other kinds of money do, but they really are value. If the dealer sells a hat for a sovereign, he knows that the sovereign does not depend, like a pound note, on the solvency of the issuer, but that it has got value put into it by costing about as much labor and skill in bringing it into existence as the hat he gives for it. But even all coins perfectly available for money are not of the intrinsic value of their denomination. The silver for making 20 shillings is a good deal less valuable as a commodity than the gold in a sovereign; and in the same way, 240 pence, which are as money equal to a sovereign, only make a percentage of it in value as merchandize. The convenience of their use for small transactions makes up for depreciation in value of coins of the inferior metals, when gold is a standard, and to prevent incidental abuses, the law limits the extent to which they are a legal tender as good money.

Money transactions are distinguished from barter, in which one commodity is transferred for another, as where the shepherd, in primitive times may be supposed to have given the agriculturist a sheep for a measure of corn. This distinction is extremely useful, since the invention of a circulating medium, which supersedes the narrow, cumbrous process of barter, by facilitating transactions of every variety of importance among all sorts of people, is a grand type of advance in civilization. Like many other distinctions, however, it has not an absolute line of demarkation. The precious metals hold their value by their being commodities as well as being money, and coins are frequently used up for plate and jewelry. Where money is only available within one narrow region its use verges on barter. In central Africa, purchases are made and debts paid by strings of beads or coils of brass wire. An ivory merchant or a traveler will lay in a stock of these, just as in Europe he would carry gold or circular notes. They are commodities, being used as ornaments by the inhabitants. But they are distributed to an extent far beyond the demand in this shape, and that they absolutely constitute money is shown by this peculiarity in the case of beads, that a particular color will pass current, and another will not; so that the merchant who chooses the wrong kind, though he have full value in merchandize, has not taken with him a supply of available cash.

Under the head of Bullion, it is shown how the precious metals are an expensive form of money, which there is a temptation to supersede by paper money. For the various opinions adopted by different classes of economists on paper money, and the devices for getting over the great difficulty of rendering this kind of money secure, and equal in value to bullion, reference is made to the article CURRENCY. It may here be proper to state, that paper money, or money founded on credit—one of the resources of advanced civilization and complicated commerce—introduces a class of moneys so extensive and various, that it is impossible to mark the limits of its extent, or enumerate the shapes it may take. An attempt has been made to get rid of all difficulties by saying that a promise to pay is only the representative of money. But if it serve the purpose of buying or paying debt, it really is money. No one hesitates in counting a £5 Bank of England note as money. But a check by a person known to have a balance or credit at a solvent bank, is equally money; and though it is an order to pay, no actual bullion need ever be given for it, for the payment may be in notes, or the holder may hand it over to his own banker, in whose accounts it will be credited to the holder, and debited against the banker on whom it is drawn. The special difficulty as to paper money is, that it may be mistaken for money when it is none, as in the case of a check not honored by payment; or, that it may be of less intrinsic value than it professes to be, as when there is what is called an over-issue (see CURRENCY). There are thus great risks attached to the use of paper money; but there are also risks specially applicable to bullion money, as light weight, base coin, and the absence of those facilities for detection in theft or fraud, which are among the advantages of paper money. The special risks attending the use of paper have been shown in practice to be so capable of remedy by legislative precautions, that at present, in Scotland, one-pound notes are taken with less suspicion than sovereigns. On transactions in general, the chance of loss from forgery or insolvency is deemed less than the chances from light weight, even if the risk of base coinage should not come into consideration.

Making allowance for coins sent abroad or used as metal, the money of Britain is calculated at: gold, £75,000,000; silver and copper, £13,000,000; and notes, £42,000,000—in all, £130,000,000. But so large is the extent of paper money, in the shape of drafts and bills, that of these payments, to the extent of more than £2,000,000,000 in a year are settled at the London clearing-houses, or the establishments where the London banks, and those dealing with them, clear off their mutual obligations by paying over the balances.

MONEY (*ante*). Originally, those substances in nature or of art which commerce among men proved to have the most general uniformity of value and convenience in use as measures of exchange of other commodities; which substances, being confirmed in such use, in civilized countries, by laws making them the sole legal tender as money, derive an increased, more certain, and more uniform value by reason of such legal confirmation of their sovereign use.

The laws pertaining to coinage formerly made by kings or ministers have been known in all ages to place in their hands a prodigious power for good or harm to their people. Since coined money has been largely displaced in modern times by legally authorized paper representatives of money, which have become *de facto* the principal actual money of all highly civilized peoples, and since this paper money is governed, like coin money, by the dominant law of convenience in use—as well as by the enacted laws of its confirmation, limitations, and powers as money—legislation pertaining to it has even greater power to promote or to destroy the prosperity of a people than when coin alone was the sport of kings. The laws which control the qualities or quantities of money, whether of coin or paper, have an influence on the public weal, vast and sudden beyond those enacted on any other subject. They strike at once every material interest of every citizen of the country which is subject to the laws. The examples of France and Germany, between 1871 and 1881, have furnished conspicuous illustrations of the helpful and hurtful power of legislation alone on money. It is especially within the present century, in Europe and in the United States, that all classes have realized this potency of legislation on money. The slightest modification of national laws concerning it affects every branch of trade, every industry, every investment. Yet a small number of the whole people, those whose business it is to deal in money as lenders or bankers, alone keep that close watch of legislation which enables them to control it unduly; so as to promote their own interests when laws are changed; or, if laws are likely to affect their interests injuriously, they are the first to be aware of the effects of changes and to guard against them. That prosperity or adversity may result to a majority of an entire people by a simple act of legislation on money, with a rapidity and a certainty that legislation on no other subject can parallel, has become obvious to all intelligent people. In England, 60 years ago, this subject attracted the observation of great numbers of able writers. But the legislation followed the interest of the moneyed powers, to the injury of the commercial and industrial classes. In France the philosophy of money, and the delicate nature of legislation on money, have called out the highest ability in its consideration for more than a hundred years. After the German war its financial administration was in the hands of Leon Say, son of a philosophic and practical financier and grandson of J. B. Say, whose works on political economy are authority to this day. Yet these men are only atoms in the mass of thought that has been given to this subject in France; whose present financial position is in part the result of its wisdom in money legislation.

The first American money that history informs us of was wampum and the dried codfish of Newfoundland. The latter were in general use as money, and answered the purpose better than any other material that could have been procured in that region. A single fish was a sufficiently small change for small transactions, and a mass of them not too cumbersome for the purchase of anything a barbarian would be likely to want. Only acquired by labor, easily preserved and transported, at all times useful to tribes away from the sea-shore, and exchangeable for what they had which the sea-shore

Indians had not, its superior convenience to any other one commodity made its adoption for money natural. On the Atlantic coast south of Massachusetts another form of money of a higher type was found among the Indians. This consisted of small shells strung like beads. They were of two kinds, white and black. The white was the periwinkle: the black was made with more labor out of the black part of a clam-shell, and was double the value of the white. Strings, groups of strings, and belts made of them were the money known as wampum. Not common enough to be found *ad libitum* and therefore representing labor in the acquisition; having the value of prettiness, lightness, divisibility by count, by strings, by belts,—this wampum was one of the most complete money measures known among barbarous nations. In the early days of the colonies, when coin money was scarce, wampum was adopted and used to great advantage in trading not only with the Indians, but among the colonists themselves. It will be seen that the sea-shore Indians had the advantage of the interior Indians in the manufacture of this money, and could buy furs, corn, and feathers probably with less labor in procuring wampum than the latter had in procuring these articles. Wampum was made a legal tender in the Massachusetts colony for 12d. only. A belt of it was 6 ft. long, and consisted of 360 beads. A white belt in Massachusetts in the early time of its settlement was the equivalent of 5s. worth of furs, and a black belt of 10s. worth. Three beads of the black and six of the white were equal to one penny. The value of this money was, after a time, seriously deranged by "an inflation" caused by the importation of beads. The Indians, seeing their superior beauty and ignorant of the illimitable quantity of them, made exchanges to great disadvantage with the whites, who imported the beads by the barrel.

In 1641, in the Plymouth colony, corn was made a legal tender for the payment of debts, "to save the debtor from the inequity of forcing him to great sacrifices in consequence of the scarcity of the money of the realm." About 1650 the exports of Massachusetts were bringing in returns of gold and silver Spanish coins. In 1652 a mint was set up in Boston to make a set of coins for home circulation, and the colonists made laws to impede the circulation of Spanish coins in order to drive them to the mint; thus recognizing, what every nation sooner or later learns, that for domestic exchanges a non-exportable currency is desirable. For some time later the lack of any sufficient recognized money in the New England colonies caused the tax collectors to be authorized to receive corn, cattle, furs, and lumber for taxes, and the local authorities were obliged to furnish accommodation for these commodities; but "lank cattle" were refused. In 1655 wampum was still received for taxes at the rate of six shells to the penny, and the limitation to 12d. as legal tender does not seem to have applied to taxes. In 1675 it was ordered by the Massachusetts colonial council that "instead of transporting barter payments of taxes to and from the treasury, the transfers should be made by paper orders." In 1686 a bank of issue sprang into existence and soon went out. The mint was discontinued in 1688. In 1690 the colony issued notes for about one-seventh of the debt contracted by a disastrous expedition against the French in Canada, and made them receivable for taxes and for goods paid into the treasury for taxes. In 1692 a premium of 5 per cent over coin was allowed at the colonial treasury for these bills, and they remained at par for 20 years.

In Connecticut about this time different kinds of money were scaled in payments. Plain "pay" was barter at the government rates. "Money" was Spanish or New England coin and wampum for change; 12d. "pay" equaled *6d.* "money." After 1700 Massachusetts issued paper money to a moderate extent. It was received for taxes and held at par with coin. In 1709 to 1711 Massachusetts, New Hampshire, Rhode Island, Connecticut, New York, and New Jersey joined in an expedition against Canada. The first colony increased its paper money moderately, and Rhode Island immoderately, and lengthened the term for its payment. The arts of banking were at this time engaging the attention of schemers the world over. John Colman in Boston proposed a plan to issue notes on land security. The council did not permit him, but did itself in 1715 "bank," that is, issue, £30,000 of notes payable in coin in 10 years. The time of payment was deferred as the term approached. In 1721 another "bank" of money was issued, drawing interest to the government, payable in hemp or flax.

In 1723 Pennsylvania authorized the issue of colonial paper money to the amount of £15,000, to be apportioned among its counties according to the amount of their taxable property, and to be loaned by the county commissioners for 16 years at 5 per cent interest, and one-sixteenth of the principal, annually. Notes paid back during the first ten years were to be loaned again for the remainder of the period. In 1729, when Benjamin Franklin commenced the publication of his first newspaper, the question of an additional issue was being discussed. About 40 years afterwards Franklin, in his autobiography, thus alludes to the subject: "About this time there was a cry among the people for more paper money; only £15,000 being extant in the province, and that soon to be sunk. The wealthy inhabitants opposed any addition, being against all paper currency, from the apprehension that it would depreciate, as it had done in New England, to the injury of all creditors. We had discussed this point in our junta, where I was on the side of an addition; being persuaded that the first small sum struck in 1728 had done much good by increasing the trade, employment, and number of inhabitants in the province; since I now saw all the old houses inhabited, and many new ones building;

whereas I remembered well, when I first walked about the streets of Philadelphia, eating my roll, I saw many of the houses in Walnut street between Second and Front streets, with bills on their doors "to be let," which made me think the inhabitants of the city were one after another deserting it. Our debates possessed me so full of the subject that I wrote and printed an anonymous pamphlet entitled *The Nature and Necessity of a Paper Currency.* The utility of this currency became by time and experience so evident, that the principles upon which it was founded were never afterwards much disputed; so that it grew soon to £55,000; and in 1739 to £80,000; trade, building, and inhabitants all the while increasing. Though I now think there are limits beyond which the quantity may be hurtful" (Spark's Franklin, vol. i, pp. 90–92).

About 1720 the commissioners of the New England colonies became alarmed at the tendency to further increase of paper notes for money, and recommended its stop. The English parliament forbade banking except under its charter, and forbade the colonial governments from emitting bills. Later the restriction was modified to permit an issue for government expenses only. In 1739 a "land bank" was set in operation in Philadelphia, which loaned its notes for 3 per cent per annum interest, and 5 per cent in principal, *both payable in merchandise.* This is one of the first American examples of the fertile banking which secures a payment of merchandise for the loan of a debt. This bank became a strong factor in politics, and as fortunes were to be made through it by the managers without any capital risked by them, they could afford to agitate energetically. "The land bank," says Sumner, "resisted its fate by social and political intrigues." In 1740 parliament required its wind up, but it managed to evade the requirement. The history of the shifts made use of to take up, to pay, and to re-issue paper money in Massachusetts and the other New England colonies for the next 36 years, is simply the example of how legislation, controlled first by men with one interest, and then by men of another interest, without any philosophic, disinterested statesmanship to harmonize conflicting interests, can keep up a financial agitation injurious to all parties. The history of the colonial paper money issues of Pennsylvania, on the other hand, which started on a more sound and philosophic basis, is much more satisfactory, and although in the end the original chart was lost sight of, the benefits far outweighed the injury resulting from their excesses.

At the beginning of the revolution the Continental congress issued its note money in addition to that which the colonies separately had already issued, and were continuing to issue under different laws and with various degrees of prudence. The first joint or "continental" issue was in Aug., 1775, for 300,000 Spanish dollars, payable in three years. Other issues followed rapidly. These notes generally passed at par with gold and silver until the latter part of 1776, when their amount reached $20,064,000. The following table condensed from Gouge's *History of Continental Money*, gives the issues and depreciation:

Amount issued up to, and inclusive of the year—

	1776	$20,064,464	Rate of exchange	Jan. 1, 1777	1¼	for 1
Added in	1777	26,426,333	for gold or silver	" 1778	4	"
"	1778	66,965,269	" "	" 1779	9	"
"	1779	149,703,856	" "	" 1780	45	"
"	1780	82,908,320	" "	" 1781	100	"
"	1781	11,408,095	" "	" 1782	500	"
Total		$357,476,541				

The French alliance in 1779 enabled congress to borrow money, and it attempted to limit the outstanding issues of paper money to $200,000,000, but did not. The loss of value of the entire issue became complete in 1781, and having been gradual as it passed from hand to hand through several years came to be regarded in the light of an involuntary tax for the maintenance of the war, which in general had fallen severely on people according to their means, though in cases it produced shameful wrongs. But, says Phillips, "if it saved the state it also polluted the equity of our laws."

In Jan., 1782, the bank of North America, chartered with a capital of $400,000, opened in Philadelphia. It was a private bank, having the confidence and support of the Continental congress. $70,000 in specie were put into its capital by citizens, and the remainder by the government in specie or foreign exchange out of a foreign loan. The bank had its origin in a union of Philadelphia citizens to supply the army. They issued the bank's notes in pay for them. Gouge, in his *History of Paper Money and Banking in the U. S.*, published in 1833, shows that it was a mistake to suppose that that bank aided the government; as its stockholders only paid in $70,000, or seven-fortieths of its capital. The government deposited $254,000, and was credited by Robert Morris with that amount of stock in the bank. The individual directors thus acquired the power to circulate $400,000 in the bank's notes, and loaned the government and others their own money and the $400,000 additional money which the government's deposits and sanction soon made current at par. The dividends were soon from 12 to 16 per cent for the stockholders, with fat livings for the organizers. "In 1785," says Gouge, "the effects of its operation began to be apparent. A temporary plentifulness of money, followed by great scarcity, usury, ruin to the many, riches to the few." In 1785 the Pennsylvania legislature repealed the bank's charter, but it continued operations by virtue of the congressional charter, and managed to get a renewal afterwards from the state by means of its great monetary influence. From the beginning of 1780 till the close of the war hard money is said to have been plenty; caused by considerable sums disbursed by the French and British armies, by the loan made to the government, and by commerce with the West Indies. France spent $3,000,000 in specie to meet her army and navy expenses, besides what came through her as loans. Such was the flux of specie to America then that in both France and England the drain was seriously felt.

In 1787 the clause in the new federal constitution that no state "shall coin money, emit bills of credit, or make anything but gold or silver coin a tender in payment of debts" would seem to have forever barred a state, not only from issuing bills of credit, but from giving charters to banks of issue; as it seems absurd that a state legislature may delegate a power to private corporations which the constitution has denied to the state itself. But the profits of the bank of North America in Philadelphia had stimulated banking; Massachusetts, New York, and Maryland gave charters to banks which the U. S. courts did not abrogate. The system of state banks thus begun did not terminate till congress wrestled with the subject and suppressed them during the great rebellion. In 1791 congress chartered the first U. S. bank. See NATIONAL BANKS and PAPER MONEY OF THE UNITED STATES. About 60 state bank charters were issued prior to 1800. Their subsequent increase and separate history in each state is without the pale of this article.

THE UNIT OF VALUE AND COINAGE LAWS OF THE UNITED STATES. In 1785 congress adopted the silver dollar as the *unit of money*. On April 2, 1792, in the law establishing a mint, it enacted that "The money of the United States shall be expressed in dollars or units;" the dollar "to be of the value of a Spanish milled dollar as the same is now current," and to contain 371¼ grains of pure silver. The same act fixed the weight of the gold eagle at $247\frac{5}{10}$ grains, or $24\frac{75}{100}$ grains to the dollar, which made the ratio of value of silver to gold, by weight, as one to fifteen. In 1834 the weight of pure gold in the eagle was reduced to 232 grains, no change being made in the weight or fineness of the silver-unit dollar. This made an ounce in gold equal as a legal tender to 16.045 oz. of silver, thus increasing the legal value of the previous coinage of U. S. gold coins nearly 7 per cent. In 1837 the composition of both the gold and silver coinage was changed, but the dollar retained the same quantity of pure silver, while the quantity of pure gold in the eagle was increased to $232\frac{2}{10}$ grains, so that the legal equivalency of gold to silver by weight was 15.988 of silver to 1 of gold. That has been the legal relationship of U. S. coins of the two metals to the present time. The quantity of pure silver in the unit dollar of the United States has remained unchanged since its adoption in 1785 and its confirmation by the coinage act of 1792. The weight of the gold eagle has been changed twice. While the legal value of silver to gold was as 1 to 15, gold was at a premium, and disappeared from circulation to pay foreign debts, as it would pay more than at home. After the ratio of 16 to 1, made by the law of 1834, until 1874, the silver dollar bore a premium over the gold dollar in the London market of from 1 to 3 per cent. Silver in consequence became scarcer, but did not entirely disappear, as gold would have done under the same condition, on account of its indispensableness for small change and the greater expense of its shipment. But to counteract the tendency to its export in consequence of its under-valuation relatively to gold, congress found it necessary to pass the act of Feb. 21, 1853, reducing the old proportion of pure silver in coins smaller than the dollar, and limiting the amount of these that could be used as legal tender to five dollars. Before that time no silver coin except the 3-cent piece was below the standard fineness of the silver-unit dollar. This act retained in the country all the small coins minted by the United States; but the standard silver dollars, being exported as fast as made, were coined less and less.

Soon after the breaking out of the rebellion in 1861, the U. S. government was obliged to provide money for carrying on the war on a scale gigantic compared with what had previously been known; and during the four succeeding years had recourse to the issue of U. S. legal tender notes and bonds for that purpose, and the organization of the U. S. national bank system. The history of the monetary legislation of this period, and the subsequent legislation that resulted from it, will be found under the heads—BANKS and BANKING, and DEBT, NATIONAL. Also, see GREENBACKS.

We now resume the history of recent legislation pertaining to metallic money.

The act of Feb. 12, 1873, now known as the demonetizing act, was one of 67 sections, matured in committee and presented to congress as an act to regulate the details of coinage at the mint. It was presumed to collate and embrace in one act all previous legislation on the subject of U.S. money. It did not demonetize the standard silver dollar. It did not make anything else the unit of value. But it only authorized the coinage of silver into half and quarter dollars and dimes (according to the reduced standard of 1853), and into a trade dollar above the standard of the unit dollar; and prohibited these coins from being a legal tender for more than five dollars in any one payment. The act contained no change in the old unit dollar. It simply omitted to mention it as one of the coins to be made at the mint, and practically accomplished its demonetization by the following words in "Sec. 17. No coins either of gold, silver, or minor coinage, shall hereafter be issued from the mint, other than those of the denominations, standards, and weights, herein set forth." This act which thus in effect, though not in terms, demonetized silver, except for small change, was not generally known to have that effect until two or three years after its passage. Eminent and careful statesmen of both houses of congress then admitted frankly that the nature and effect of this part of the bill were a complete surprise to them. It was a part of a well concerted policy begun in Europe to bring about the single gold standard, but which inaugurated a revolution in money far more momentous in its consequences, than its supporters themselves had any conception of. See MONETARY COMMISSION, CONGRESSIONAL, 1876; and MONETARY CONFERENCE, PARIS, 1878. The legislation in congress to complete the demonetization of silver was closed by these words in section 3,586 of the revised statutes: "The silver coins of the United States shall be a legal tender at their nominal value for any amount not exceeding five dollars in any one payment." Thus the stop of coinage of silver dollars by the act of Feb., 1873, was phrased in the revised statutes so as to destroy the legal tender of the silver dollar without any act having been passed to that purport. In the language of the report of the joint monetary commission of the 44th congress appointed Aug. 15, 1876, "the ancient money of the country, instead of being intentionally legislated out of existence by congress, was revised out of existence." The main reason given in congress at the time of the passage of the coinage act for ceasing to coin the silver dollar, was that its value was 3 per cent above the standard for a gold dollar. It was "standing guard against a rise in gold." The following is a copy of the provisions of the revised statutes down to Mar. 4, 1875, concerning all forms of legal tender money then recognized:—

"Sec. 3,584. No foreign gold or silver coins shall be a legal tender in payment of debts.

"Sec. 3,585. The gold coins of the United States shall be a legal tender at their nominal value when not below the standard weight and limit of tolerance provided by law for the single piece, and when reduced in weight below such standard and tolerance, shall be a legal tender at valuation in proportion to their actual weight.

"Sec. 3,586. The silver coins of the United States shall be a legal tender at their nominal value for any amount not exceeding five dollars in any one payment.

"Sec. 3,587. The minor coins of the United States shall be a legal tender at their nominal value for any amount not exceeding 25 cents in any one payment.

"Sec. 3,588. United States notes shall be lawful money, and a legal tender in payment of all debts public, and private, within the United States except for duties on imports and interest on the public debt.

"Sec. 3,589. Demand treasury notes authorized by the act of July 17, 1861, chap. 5, and the act of Feb. 12, 1862, chap. 20, shall be lawful money and a legal tender in like manner as U.S. notes.

"Sec. 3,590. Treasury notes issued under the authority of the acts of Mar. 3, 1863, chap. 73, and June 30, 1864, chap. 172, shall be legal tender to the same extent as U.S. notes, for their face value, excluding interest: *Provided*, That treasury notes issued under the act last named shall not be a legal tender in payment or redemption of any notes issued by any bank, banking association, or banker, calculated or intended to circulate as money.

At the end of 1874 certain sagacious minds became aware of the concerted action among great holders of government securities in Europe and the United States to procure the entire demonetization of silver, and the general adoption of the gold unit of value; and sounded the alarm that so great a revolution as the entire suppression of the money function of one half the money of the world ought to awaken. The more the subject was thought of, the greater seemed the impending danger, so that when the subject came up for discussion in the 45th congress it absorbed public attention more than any other. The exhaustive debates in the press and in congress on an act, known as the Allison bill, entitled "*An act to authorize the coinage of the standard silver dollar, and to restore its legal tender character*," resulted in a vote in the house of representatives, passing the bill by a majority of more than three to one, without division by party lines. President Hayes vetoed the bill, and congress promptly repassed it on Feb. 28, 1878, by a vote of 46 yeas to 19 nays in the senate, and 196 yeas to 73 nays in the house. It forms chap. 20 of the acts of the 45th congress. Sec. 1. provides for the coinage of the original silver dollar of the same weight, fineness, devices, and superscriptions, required by the act of 1837; that it, and all previously coined silver dollars of the United States shall be a legal tender at their nominal value, for all debts and dues public and private except where otherwise expressly stipulated in the contract; that the secretary of the treasury is authorized and directed to purchase from time to time, silver bullion, at the market price thereof, not less than $2,000,000 worth per month, and cause the same to be coined monthly, as fast as so purchased into such dollars, "provided that the amount of money at any one time invested in such silver bullion, exclusive of such resulting coin, shall not exceed $5,000,000; and provided further, that nothing in the act shall be construed to authorize the payment in silver, of certificates of deposit issued under the provisions of sec. 254. of the revised statutes," Sec, 2. provides that the president after the passage of the act shall invite the countries composing the Latin union, so called, and other European governments to join the United States in a conference "to adopt a common ratio between gold and silver, for the purpose of establishing internationally, the use of bi-metallic money," to which conference he should appoint three commissioners. See MONETARY CONFERENCE, PARIS, 1878. Sec. 3. provides that "any holder of the coin authorized by this act may deposit the same with the treasurer or any assistant treasurer of the United States, in sums not less than ten dollars, and receive therefor certificates of not less than ten dollars each, corresponding with the denominations of the U.S. notes. The coin deposited for, or representing, the certificates shall be retained in the treasury for the payment of the same on demand. Said certificates shall be receivable for customs, taxes, and all public dues, and, when so received may be re-issued."

The total product of the United States mints in coins of gold and silver and baser metals from 1793 to 1880, inclusive, are here given:

Years.	Gold.	Silver.	Small Coins, Alloy.
Prior to 1835	$15,780,160	$39,690,099	$11,919,888
1835 to 1852 (inclusive)	231,011,460	39,523,292	
1853 to 1873 (inclusive)	580,114,258	65,928,512	
1874	50,442,690	5,983,601	411,925
1875	33,553,965	10,070,368	230,375
1876	38,178,962	19,126,502	260,350
1877	44,078,199	28,549,935	62,125
1878	52,798,980	28,290,825	30,694
1879	40,986,912	27,227,883	97,798
1880	56,157,785	27,942,437	269,971
Each Total	$1,133,108,321	$292,333,438	$13,283,166

Total United States coinage for 87 years............ $1,438,719,925.

Secretary Sherman in the treasury report for 1880, estimates:

The gold coin and bullion in the United States, Oct. 1, 1880..	$453,882,692
The silver " " " " " ..	158,320,911
Total specie in circulation, in banks and treasury of U. S....	$612,203,603
United States notes (greenbacks) outstanding, Oct. 1, 1880....	$346,681,016
National bank notes " "	343,949,893
Total paper money authorized by national legislation.........	$690,630,909

There was held in the U. S. treasury at the above date, mostly in gold and silver coin and bullion, $201,088,622. Deducting this from Mr. Sherman's estimate of the total specie in the country, it would leave a balance of about $400,000,000, to be divided between bank reserves and circulation. This is believed to be an over-estimate. It is probable that the amount of specie in actual circulation, together with the paper currency of the country, amounts in 1880 to very near $1,000,000,000, or $20 per head of the population. The following table gives the currency statistics of the United States for the past 15 years. No estimate is made of the gold and silver coin in circulation between 1865 and 1877, as it was scarcely used during that time except at the custom houses and in California. The amount in use was probably under $50,000,000:

MONEY IN THE UNITED STATES FROM 1865 TO 1880, INCLUSIVE.

Year.	UNITED STATES ISSUES.			Notes of National Banks including Gold Notes.	Coin in Circulation Estimated.	Aggregate.
	Legal Tender Notes.	Old Demand Notes.	Fractional Currency.			
1865	$432,757,604	$402,965	$26,344,742	$176,213,955	....	$635,719,236
Jan. 1, 1866	425,839,319	392,070	26,000,420	298,588,419	....	750,820,228
1867	380,276,160	221,682	23,732,812	299,846,206	....	709,076,860
1868	356,000,000	139,157	31,597,583	299,747,569	....	687,504,279
1869	355,892,975	128,098	34,215,715	299,629,322	....	689,866,110
1870	356,000,000	113,098	39,762,664	299,904,029	....	695,779,791
1871	356,000,000	101,086	39,955,089	306,307,672	....	702,403,847
1872	357,500,000	92,801	40,767,877	328,465,431	....	726,826,109
1873	358,557,907	84,387	45,722,061	314,582,812	....	748,947,167
1874	378,401,702	79,637	48,544,792	350,848,236	....	777,874,307
1875	382,000,000	72,317	46,390,598	354,128,250	....	782,591,165
1876	371,827,220	69,642	44,147,072	346,479,756	....	762,523,600
1877	366,055,084	65,462	26,348,206	321,595,606	$50,000,000	764,064,358
1878	349,943,776	63,532	17,764,109	321,672,505	100,000,000	789,443,922
1879	346,681,016	62,035	16,108,159	323,791,674	150,000,000	836,642,884
1880	346,681,016	61,350	15,674,304	342,387,336	200,000,000	904,804,006
Nov. 1, 1880	346,681,016	60,835	7,181,861	343,834,107	250,000,000	947,757,809

The following table, except as to the United States, is from the *American Almanac* for 1880, showing the population and the amount of money in circulation in different countries:

Country.	Date.	Population.	Paper Money.	Gold.	Silver.	Total.	Per Capita.
Austria	1869	35,904,435	$322,938,854	$43,200,000	$27,360,000	$393,498,854	$10.93
Australia	1879	2,600,000	21,604,936	45,000,000	5,000,000	71,604,936	27.54
Belgium	1876	5,336,185	58,419,000	110,000,000	64,000,000	232,419,000	43.55
France	1876	36,905,788	466,755,000	733,400,000	425,844,850	1,159,244,850	44.06
Germany	1875	42,727,360	229,596,220	328,168,462	214,939,957	772,704,639	18.08
Great Britain	1871	31,628,338	209,148,875	618,619,043	93,376,168	921,144,086	29.11
Italy	1871	26,801,154	135,000,000	17,000,000	20,000,000	172,000,000	6.42
Netherlands	1869	3,579,529	73,230,000	20,000,000	57,980,000	151,210,000	42.24
Russia	1876	86,952,347	587,907,562	108,000,000	2,500,000	698,407,562	8.03
Switzerland	1870	2,759,854	21,300,000	60,000,000	34,700,000	116,000,000	42.03
United States	1870	38,558,371	695,779,791	30,000,000	20,000,000	745,779,791	19.31
	1880	50,152,554	697,737,812	200,000,000	50,000,000	947,757,809	18.90

The table, imperfect in not giving money circulation of the several countries at the same date, is nevertheless near enough their average condition financially to indicate their wealth and their financial policy. The comparison between the relative wealth of Russia and Switzerland is curious. The ratio of currency per capita varies far more among nations than has generally been supposed; and although in general the countries having the most accumulated wealth have the greatest ratio of money in circulation, the proportion is not uniform; and the proportion of the whole currency of each, to the amount of gold and silver that each controls, is not apparently subject to any law. The table would seem to lead to the conclusion that the most intelligent and active commercial nations use the most per capita. This would certainly be true where business is principally conducted on the cash system.

Persons desirous of studying money questions will find the most complete list of works to choose from in the appendix to vol. 5. of the executive documents of the 3d session of the 45th congress, being the report of the commission appointed to represent the United States in the monetary conference in Paris in 1878. The books and pamphlets are there arranged in chronological order down to the beginning of 1879. A large part of the most valuable literature on the subject is in the form of pamphlets. Among the most instructive of recent books the following is a selected list of those in the English language: *Money and Trade*, 1879, by prof. Francis A. Walker of N. Y.; John Sherman's *Speeches and Reports on Financial Questions*, 1 vol., 1879; *Silver and Gold*, 1876, and *The Monetary Situation*, 1878, both by S. Dana Horton of Cincinnati; *Gold and Debt*, W. L. Fawcett, Chicago, 1877; *The Money Question*, by W. A. Berkey, Grand Rapids, Mich., 1876; Senate document, *Report of the Monetary joint committee of Congress in* 1877; *Repor of the Paris Monetary Commission of* 1878, just mentioned. These government reports are compendiums of facts and opinions of great value. Sumner's *History of American Currency* is a racy sketch, but crude in its reflections. *Money and the Mechanism of Exchange*, by W. S. Jevons of London, is one of the high authorities on money in connection with banking. The most valuable old work on "Paper-money and Banking in the United States" is that of Wm. M. Gouge, Philadelphia, 1833. Kellogg's *New Monetary System*, 1837, is a remarkable elaboration of speculative philosophy concerning money. *The Ways and Means of Payment*, by Stephen Colwell, Philadelphia, 1859, is an analytic treatment of money and credit of high value.

For practical elucidations of the money questions of the day, the works of French writers are among the clearest. The following are eminent: Henry Cernuschi, Emile de Lavaleye, M. Leon Say, Victor Bonnet, M. Chevalier, E. de Parieu. Of modern British authors, Walter Bagehot, W. T. Thornton, Stephen Williamson, Ernest Seyd, W. Stanley Jevons, John Stuart Mill; and of old writers bishop Berkeley and Adam Smith are classic authorities on various sides of money questions. C. Feer Herzog, of Switzerland, is the great champion of a single gold standard. His works are published both in French and German. Count Charles Rusconi is an eminent Italian monetary statesman and writer.

MONGE, GASPARD, Comte de Péluse, a French mathematician and physicist, was b. of humble parentage at Beaune, in the department of Côte d'Or, May 10, 1746. When only fifteen, he went to study natural philosophy at the oratorian college of Lyons, and afterwards obtained admission into the famous artillery school at Mézières, where he invented the method known as "descriptive geometry," which was at first received with incredulity, but afterwards with avidity, and, for a time, jealously kept secret by the military authorities. In 1772 Monge became tutor and professor at Mézières; in 1780 he was chosen a member of the French academy; and in the same year was called to Paris as professor of hydrodynamics at the Louvre. As a lecturer, he was precise, clear, and brief; his style was a model of scientific rigor, if not of literary elegance. During the heat of the revolution, he became minister of marine, but after a few months resigned the office. He did not, however, retire into obscurity, but took charge of the great manufactories improvised for supplying the million of soldiers whom republican France had lanched against her enemies, with arms and gunpowder. At this critical period, he showed himself possessed of a genius equal to the occasion. He was everywhere, animating, ordering, counseling, and directing the patriotic artisans. Yet it is characteristic of the insane fanaticism that, for a time, got the upper hand in France, that Monge himself only escaped the guillotine on account of his services being absolutely indispensable. After he had founded the *ecole polytechnique*, he was sent by the directory to Italy, and intrusted with the transport of the artistic spoils of the republican armies. Here he formed a close friendship with Bonaparte, whom he followed to Egypt. He now undertook the management of the Egyptian institute. During the expedition to Syria, he performed the greatest services to the government established at Alexandria. On his return to France, he resumed his functions as professor in the ecole polytechnique, and, though his reverence for Napoleon continued unabated, he hotly opposed his aristocratic and dynastic views. The title of comte de Péluse (Pelusium) was conferred on him by Napoleon, in memory of the Egyptian expedition. He died July 28, 1818. Monge's principal works are: *Traité Elémentaire de Statique* (7th edit. Paris, 1834); *Leçons de Géométrie Descriptive* (6th edit. Paris, 1837); and *Application de l'Analyse à la Géométrie des Surfaces du* 1 *et du* 2 *Dégré* (4th edit. Paris, 1809). See Dupin's *Essai Historique sur les Services et les Travaux Scientifiques de Monge* (Paris, 1819).

MONGHYR', a city of India, capital of a district of the same name, is situated on the right bank of the Ganges, 80 m. w.n.w. of Bhagulpur. It is a large and thriving town, and carries on extensive manufactures of hardware and fire-arms, which, however, are of very inferior quality. Owing to the salubrity of its climate, it is a favorite residence of invalided military men and their families. Pop. '72, 59,698. The district has an area of 3,913 sq.m., with a pop. of 1,812,986. Monghyr is on the line of the East Indian railway.

MONGOLIA (MONGOLS, *ante*), "the country of the Mongols," comprises a vast extent of territory in the interior of Asia, and forms a part of the Chinese empire. It extends over an area of 1,200,000 sq.m., between lat. 37° and 54° n., and 85° and 125° e. long., and is bounded on the n. by Siberia, e. by Mantchooria, s. by China proper, and w. by e. Turkistan and Dzungari; pop. 2,500,000, of whom 500,000 are Chinese. It is more than 1700 m. in length; its width, from n. to s., varying between 600 and 1000 miles. For the most part it is a high table-land, 3,000 ft. above the level of the sea, arid, without running water, and without important vegetation. The central portion is the great desert of Gobi, extending s.w. and n.e., from the boundary-line of the province of Kansu to the Dalai Nor, near the boundary of Dauria, having an average width of 200 miles. This is the worst part of the country, the surface being covered with sand and stones, and the vegetation scanty and occasional. Vast tracts are level; but, at great distances from each other, there are hills of moderate elevation. The entire region is destitute of trees, and the water, which is only found at some distance below the surface, is brackish. South-east of the Gobi extends a more elevated and uneven country, terminating in a mountain range of considerable height. This range, the Alashan or Ho-lang Shan, begins near the most southern point of Mongolia, near the banks of the river Hoang-ho, and extends northward along that river nearly 400 miles. Near 42° n. lat. it turns abruptly to the e., forming nearly a right angle, and continues in this direction about 600 m., being now under the name of Inshan. It finally proceeds in a n.e. direction from 42° to 55°. Its highest point has an elevation of more than 15,000 ft. above the sea. The country skirting this range is unfit for agriculture, and is only used as pasture-ground. South of the Inshan mountains there are fertile valleys and mountains partly wooded. To the e., and extending to the Yellow sea, is a narrow tract of fertile land. And southward, again, the country contains numerous meadows clothed with rich grass, where agriculture has been introduced by the Chinese, who send thither criminals who have been condemned to transportation. The most southern district is the haunt of wild animals, including tigers and leopards, and is the hunting-ground of the Chinese. It contains the palace of Ichol, which was described by sir George Staunton. The country which extends along the n.w. side of the desert of Gobi is little known, with the exception of the e. part, which is traversed by the caravan road from Kiachta in Siberia to Khalgan in China. Here the surface of the country is frequently broken by hills and isolated ridges; but the intervening level tracts contain rich pasture-ground. It is mostly well watered, but wood is scarce. In advancing northward the hills are higher, and the valleys, or intervening tracts, grow narrower, till near the boundary-line between Mongolia and Siberia the country rises into mountains, which run in a continuous chain, and are a portion of the Altai mountains. Here originate the principal rivers of Mongolia, the Selenga and its numerous upper branches; the Kerlon and the Onon, which, by their union, form the Amur. This country is rich when compared with the other parts of Mongolia. The western part of Mongolia is traversed by a mountain range, which, near its w. extremity, is connected with the Altai mountains not far from the e. bank of the Irtish. That portion of the country which lies s. of this range seems to partake largely of the nature of the Gobi, extending mostly in sterile plains. The Irtish is the largest river in this country, and runs about 160 m. before it falls into lake Zaizan.

The climate of the whole of Mongolia is generally cold, though it is subject to sudden changes, and in summer is insupportably hot. The snow-fall, however, is very light. The wealth of the Mongols consists in their numerous herds of cattle (on the more hilly tracts), camels, horses, and sheep. Wild animals are numerous, including hares, antelopes, wild asses, foxes, deer, sables, squirrels, and marmots. Water-fowl are plentiful in the lakes which abound in the n.w. part. The wolves are numerous and savage, attacking even the shepherds in preference to the sheep: there are also the brown and black bear, the yak, and the ounce. The double-humped or Bactrian camel is domesticated for its milk. It is remarked that in the southern portion, where the Chinese practice agriculture, the temperature has risen with the progress of cultivation of the soil, and that grain is now grown there, and ripens readily, which could not formerly be cultivated on account of the cold. The Mongols are generally nomadic, and live in tents. They have sometimes been curiously confounded with the Tartars, and Mongolia is called Tartary on many old maps. No two nations could physically be more distinct, though both are addicted to the same nomadic mode of life. The Tartars belong to the Turki race, from whom the European Turks are descended. The Mongol race, which is far more numerous than the Tartar, is dispersed over almost all the eastern countries of Asia, but it is to the restless hordes of middle Asia, and to the Buriates, Bashkirs, Kalmucks, and other roving tribes that the name of Mongols is chiefly restricted.

MONGOLS, the name of a numerous and widely spread branch of the human family—the second in the classification of Blumenbach, and corresponding in almost every respect with the branch designated as Turanian by more recent ethnologists. See TURANIANS. Under the designation of Mongols are included not only the Mongols proper, but the Chinese and Indo-Chinese, Thibetans, Tartars of all kinds, Burmese, Siamese, Japanese, Esquimaux, Samoieds, Finns, Lapps, Turks, and even Magyars. Collectively, they are the great nomadic people of the earth, as distinguished from the Aryans, Semites, and Hamites; and are the same who, in remote antiquity, founded what is called the "Median empire" in lower Chaldea, an empire, according to Rawlinson, that flourished and fell between about 2458 and 2234 B.C.; that is, before Nineveh became known as a great city. Thus early did some of these nomadic tribes, forsaking their original pastoral habits, assume the character of a nation. Another great offshoot from this stock founded an empire in China, the earliest date of which it is impossible to trace, but which certainly had reached a state of high civilization at least 2000 years B.C. In early Greek history they figure as Scythians, and in late Roman, as Huns, carrying terror and desolation over the civilized world. In the middle ages they appear as Mongols, Tartars, and Turks. In the beginning of the 13th c., Genghis-Khan (q.v.), originally the chief of a small Mongol horde, conquered almost the whole of central and eastern Asia. His sons and grandsons were equally successful, and in 1240–41, the Mongol empire extended from the sea-board of China to the frontiers of Germany and Poland, including Russia and Hungaria, and the whole of Asia, with the exception of Asia Minor, Arabia, India, and the Indo-Chinese states, and northern Siberia. This vast empire soon broke up into a number of independent kingdoms, from one of which, Turkistan, arose another tide of Mongol invasion under the guidance of Timour or Tamerlane, who, in the latter part of the 14th c., reduced Turkistan, Persia, Hindustan, Asia Minor, and Georgia under his sway, and broke, for a time, the Turkish power. On the death of his son Shah Rokh, the Mongol empire was subdivided, and finally absorbed by the Persians and Usbeks, but an offshoot of Timour's family founded, in the 16th c., the great Mogul empire of Delhi. After the decline of Timour's empire the Turkish branch maintained the glory of the race, and spread terror to the very heart of western Europe. In the 9th c. the Magyars, a tribe of Ugrians, also of Mongol extraction, under their leader Arpad, established themselves in Hungary, where, in process of time, they became converted to Christianity, and founded a kingdom famous in European history. See TURKS and HUNGARY.

The physical characteristics of the Mongols in their primitive state are thus described by Dr. Latham in his *Descriptive Ethnology:* "The face of the Mongolian is broad and flat. This is because the cheek-bones stand out laterally, and the nasal bones are depressed. The cheek-bones stand out *laterally*. They are not merely projecting, for this they might be without giving much breadth to the face, inasmuch as they might stand forward. . . . . The distance between the eyes is great, the eyes themselves being oblique, and their carunculæ being concealed. The eyebrows form a low and imperfect arch, black and scanty. The iris is dark, the cornea yellow. The complexion is tawny, the stature low. The ears are large, standing out from the head; the lips thick and fleshy rather than thin, the teeth somewhat oblique in their insertion, the forehead low and flat, and the hair lank and thin." Of course, such a description as this cannot be understood as applying to the more civilized nations of Mongol origin, such as the Turks and Magyars, especially the latter, who in physical appearance differ but little, if at all, from other European nations.

In religion, the Mongols are, for the most part, Buddhists. There are among them, however, according to the different countries in which they reside, various other religions, as Confucianism, Tauism, fire-worship, paganism of different kinds, Mohammedanism, and Christianity. The Mongol languages, which are very numerous, are described by Dr. Latham as being "aptotic and agglutinate, rarely with true amalgamate inflection." In 1859, according to an estimate formed by prof. Dieterici, the Mongols of all kinds amounted in number to as many as 528,000,000, or about half of the human race.

MONGOUS. See Ichneumon, *ante.*

MONHEGAN ISLAND, off the coast of Hancock, co., Maine. Pop. 145. The first account of it is by capt. John Smith. It has a stone light-house.

MONIMIA'CEÆ, a natural order of exogenous plants, consisting of trees and shrubs, with opposite leaves destitute of stipules; the bark and leaves having an aromatic fragrance. The flowers are unisexual. The perianth is somewhat globose, divided at the border sometimes into more rows than one. The stamens are numerous, and arise from and cover the whole interior of the tube of the perianth. There are several ovaries, each with one ovule. The fruit consists of several achænia, inclosed within the enlarged calyx. There are about 40 known species, natives chiefly of South America. A few are found in New Zealand and Australia. The fruit of the Boldu (*boldoa fragrans*), a shrub or small tree, a native of Chili, is eaten. It is a little drupe, about the size of a currant, extremely fragrant when dried.

MONITA SECRETA Societatis Jesu, secret instructions for the Jesuitic order, in a volume first published at Cracow, 1612, in Latin from the Spanish, by an unknown editor. It was then and afterwards regarded by scholars as the work of Claude Acquaviva, the general of the order, exercising over it complete control, and esteemed the ablest and most profound politician of his time. He did nothing to prove the book a forgery, and, so far as known, did not deny that he was the author. It continued unmolested until his death. In 1615 a commission was appointed to search out the author, but none was found. In the following year the book was placed in the Index. In 1633 Casper Schoppe, a German scholar, published an account of a book which had fallen into his hands, and which proved to be the same as the *Monita Privata*, but had been obtained from a source independent of the first. In the British museum there is a volume printed at Venice in 1596, which contains on several manuscript leaves, in writing of an ancient date, the whole of the *Monita Secreta.* In 1658, during Cromwell's administration, an edition of the book was printed in England. On the continent a French version was printed in 1661, and a second edition of Schopp's book in 1668. In 1669 Henry Compton, canon of Christ church, Oxford, published an edition found in MS. in a Jesuit's closet after his death, thus supplying an additional copy independent of all the others. In 1713 Henri de St. Ignace published the *Monita Secreta* in an appendix to his work on the necessity of reforming the order. This passed through four editions. In 1717 the book was published at Amsterdam, and in 1727 at Cologne. After the suppression of the order in 1773 several MSS. were found in their colleges and other resorts. In 1782 a MS. found in Rome was printed there, as was thought by the editor, for the first time. In 1831 an edition was published at Princeton, N. J., and in 1844 it was reprinted at New York. In the 17th c. Dr. Johann Gerhard referred to the book as undoubtedly genuine, and his opinion was indorsed by nearly all Protestant church historians. M. Gachard, a man of great learning and sagacity, whose critical investigations Prescott and Motley highly esteemed, says that at the suppression of the Jesuit order in the Netherlands there were discovered in one of their colleges some of their most important papers, among which were the *Monita Secreta;* that a translation of the book was made by order of government, and still exists in the archives of the kingdom. This, he testifies, differs in nothing that is material from that which has been made public. On the other hand, the eminent church historian Gieseler decided against the genuineness of the book; Isaac Taylor, in his article on the Jesuits, contained in the 8th edition of the *Encyclopædia Britannica*, says that the *Monita* is believed to be a spurious production; and prof. Schem, in the *Biblical Cyclopædia* of McClintock and Strong, says that the book was not written by a Jesuit, but is a satire.

MONITEAU, a co. in central Missouri, bounded n.e. by the Missouri river; drained by Saline, Moniteau, and Moreau creeks; 400 sq.m.; pop. 80, 14,349—13,376 of American birth. It is intersected by the Missouri Pacific railroad, and by a branch of the St. Louis, Kansas and Northern. The surface is rolling and broken; in great part covered with valuable forests. Indian corn, wheat, oats, and pork are the staples. Iron, lead, bituminous coal, and several varieties of limestone, used as building material, are found. There are several flourishing towns. Co. seat, California.

MONITEUR, Le, a celebrated French journal, started by the publisher, Charles Joseph Panckoucke, May 5, 1789, under the title of the *Gazette Nationale, ou le Moniteur Universel.* After the crisis of Aug. 10, 1792, its importance as a daily register of the events which occurred during the dark days of the revolution, immensely increased. Whoever wishes to obtain a complete view of the phenomena of the reign of terror, should consult Thuan-Grandville's *Gazette Nationale, ou le Moniteur Universel, commencé le 5th Mai,* 1789, *précédé d'une Introduction historique contenant un Abrégé des anciens États généraux, des Assemblées des Notables, et des principaux Événements qui ont amené la Révolution* (1796). In 1800, it altered its form so far as to divide itself into two halves, of which the first contained the *actes du gouvernement.* This change imparted to the journal something of an official character. After Jan. 1, 1811, it dropped the title of

Gazette Nationale, retaining only that of *Moniteur Universel*. After the restoration, it became the government organ, which it continued to be until 1869, when its official connection was discontinued.

MONITOR, a name given to many species of saurian reptiles, nearly allied to the true lizards, from which they differ in having no teeth on the palate. Among them are some of large size, the largest of existing saurians except those of the crocodile tribe. The tail of the greater number is laterally compressed, the better to adapt them to aquatic habits. They receive the name monitor from a notion that they give warning by a hissing sound of the approach of a crocodile or alligator. For the same reason, some of the American species receive the French name *sauvegarde*. Those of the old world form the family *monitoridæ*, and those of America the family *teiidæ* of some naturalists. There are several genera of both.—The MONITOR or VARAN OF THE NILE (*M. Niloticus*) is of a rather slender form, and has a long tail. It is olive gray, mottled with black. It attains a length of five or six feet. Crocodiles' eggs form part of its food. The TEGUEXIN (*teius Teguexin*) of Brazil and Guiana is of similar size. It preys on aquatic animals. Other large species are plentiful in almost all tropical countries, They are powerful animals, have strong teeth, and defend themselves vigorously if attacked. Some comparatively small species, feeding chiefly on insects, are found in dry situations. Some of the large South American species are used for food.

MONITOR. See TURRET-SHIP.

MONITO'RIAL SYSTEM, or MUTUAL INSTRUCTION. It first occurred to Dr. Bell (q.v.), when superintendent of the orphan hospital, Madras, in 1795, to make use of the more advanced boys in the school to instruct the younger pupils. These youthful teachers were called monitors. The method was eagerly adopted by Joseph Lancaster (q.v.) who, in the first years of this century, did so much for the extension of popular education; and from him and the originator, the system was called indifferently the Madras and the Lancastrian, as well as the monitorial or mutual system. The monitorial system is not, as is commonly supposed, a method of teaching; it is simply a method of organizing schools, and of providing the necessary teaching power. At a time when the whole question of primary education was in its infancy, the state refusing to promote it on the ground that it was dangerous to society, and the public little disposed to contribute towards its extension, it was of great importance that a system should be adopted which should recommend itself as at once effectual and economical. It was manifest that even with the most skillful arrangement of classes, a single teacher could not undertake the tuition of more than 80 or 90 pupils; while, by the judicious employment of the cleverer boys under the general direction of the master, the school might be made almost self-working, and 300 or 400 children taught where there was only one adult superintendent. The novelty and economy of this plan, and we may add also, its temporary success, gained for it a large and enthusiastic support both in Britain and in Germany. But the importance of the system as an educational agency was universally overrated, for although it is to be admitted that, under an able and enthusiastic master, boys may be inspired to teach well all technical and rote subjects (as, for example, in the Latin and Greek classes under Dr. Pillans of the Edinburgh high school), yet it is manifest that children so instructed are not in any sense of the word educated. Their monitor necessarily lacks the maturity of mind which is indispensable to the instructor, whose business it is to arouse in the child those mental operations which have taken place within himself, and so lead him to an intelligent and rational grasp of intellectual and moral and physical truths. No amount of private instruction from the master, no enthusiasm could ever enable a boy to do this, and consequently the system broke down, after having done its work by being the engine whereby a large interest was stirred up in the education of the masses, and whereby the requisites of a primary teacher were brought into view. The reaction against the system, however, was not so violent in Great Britain or in Holland or France, as in Germany. In England, the monitorial system was modified in such a way as to secure for the master the aid of the more clever boys in teaching rote subjects, in revising lessons, keeping registers, and supervising the work of those classes not directly under the master's tuition. In this way were afforded the means of training for the teaching profession boys who seemed fitted by natural endowment for the work. Hence the prevalent employment in this country of paid monitors and pupil teachers (male and female), who are regularly apprenticed to school-managers and teachers, and go forward to be trained in the normal schools now so numerous.

MONK. See MONACHISM; MONASTERY; *ante*.

MONK, GEORGE, duke of Albemarle, was the son of sir Thomas Monk of Potheridge, in Devonshire, and was born at his father's residence, Dec. 6, 1608. He spent some of his earlier years in the service of Holland, returned to England when about the age of 30, and served in the king's army against the Scots in 1639, attaining the rank of lieut.-col. On the breaking out of the Irish rebellion, in 1642, he was appointed col. of lord Leicester's troops, sent to crush it. When the civil war began, these troops were recalled, and Monk was imprisoned on account of being supposed to favor the cause of the parliament, but was soon after released. In 1664 he was defeated and taken prisoner by Fairfax, and imprisoned in the Tower, from which he was liberated, after two years, on his swearing the Covenant. Clarendon hints that he sold himself for money. He was now intrusted with the command in the n. of Ireland. Cromwell had a high opinion of his military talents, and made him his lieut.gen. and commandant of artillery; and the service which he rendered at the battle of Dunbar was so great, that he was intrusted with the chief command in Scotland. In 1653, he was joined with admiral Blake in an expedition against the Dutch, and with his division of the fleet, consisting of 100 ships, defeated admiral Van Tromp off Nieuwpoort, and fought another battle with him off Katwijk, in which the victory was doubtful, but Van Tromp lost his life. In April 1654, Cromwell sent him to Scotland as governor, in which difficult office he conducted himself with vigor, moderation, and equity. Even the highlands, those immemorial "sanctuaries of plunder," as Guizot calls them, were reduced to order. His principal residence was Dalkeith, where he spent his leisure hours in gardening, of which he was very fond. When, after Cromwell's death, he saw everything in confusion, and felt his own position perilous, he crossed the English border, Jan. 1, 1660, with 6,000 men, united his troops with those which Fairfax had collected for Charles II., and entered London unopposed, although as yet he kept his views profoundly secret. His powers of dissimulation and reticence were immense. Everybody felt that the decision lay with "Old George," as his soldiers used to call him; every party courted him; he was even offered the protectorate; but while he offended nobody, he declined to connect himself with any of the sectaries, and waited patiently the course of events. His own wish (though it did not proceed from any very high-minded motive) was to bring back the Stuarts; and before long, he saw that the nation in general was thoroughly with him. On the 21st of Feb. he called together the remaining members of the parliament which had been violently driven out 12 years before, and Charles II. was presently recalled. Monk was now made duke of Albemarle, loaded with honors, and intrusted with the highest offices in the state. But he soon retired from political affairs. In 1665, when the plague ravaged London, and every one fled that could, "Old George," as governor of the city, bravely stuck to his post, and did what he could to allay the terror and confusion Next year, he was employed as second in command of the fleet sent under the duke of York against the Dutch; and was defeated by Von Ruyter in a sea-fight off Dunkirk, but soon after gained a bloody victory over him off North Foreland. He died Jan. 3, 1670. Guizot describes him as a "man capable of great things, though he had no greatness of soul." See Guizot's *Monk*, *Chute de la Republique*, Skinner's *Life of Monk*, Hallam's *Constitutional History*, and Macaulay's *History of England*.

MONKEY, *Simia*, a Linnæan genus of *mammalia*, of the Linnæan order *primates*, and of Cuvier's order *quadrumana*, now constituting the family *simiadæ*. The word monkey was formerly of almost, if not altogether, the same signification with *ape*; but the name *ape* is now more generally applied to those *simiadæ* which have no tail and no cheek-pouches; the name monkey to those which have cheek-pouches and long tails, prehensile or not prehensile; whilst the name *baboon* (q.v.) is applied to creatures considerably different from both. The smaller tailless *simiadæ* are, however, still not infrequently spoken of as monkeys, and the term is also sometimes used to comprehend all the *simiadæ*.

Of all animals, the *simiadæ* exhibit the greatest resemblance to man, both in their general form and their anatomical structure. This is particularly the case with some of the larger apes. In none of them, however, is there a natural adaptation for the erect position so characteristic of man, which is assumed rarely, and in general only by captive individuals, as the result of training and constraint, all of the monkey tribe preferring to walk on four feet rather than on two, but all of them being adapted for living chiefly among the branches of trees, or—according to the habits of a comparatively small number of species—among bushy cliffs, where they make use of the four extremities for prehension, as hands. Most of them leap from branch to branch with wonderful agility, and some also swing themselves from a branch by their long prehensile tail, till they can seize hold of another branch. The thumb, in all the four extremities, is opposable to the fingers, which are long and flexible; but there are some monkeys which want the thumb of the fore-limbs, or have it merely rudimentary, whilst the hind-limbs are always furnished with perfect hands. In attempting to walk erect, an ape necessarily treads, not on the soles, but on the sides of its feet, which are turned inwards, and the muscles of the legs do not enable it to maintain an erect position long or easily. This difficulty is increased by the way in which the head is affixed to the vertebral column, the *occipital foramen* being further back than in man, so that the weight of the head is thrown forward. The face of a monkey exhibits a grotesque resemblance to that of man; but the lower forehead, the less perfect nose, and the more projecting jaws, give it a brutal character. The dentition of monkeys is so similar to that of man, that the dental formula for very many is the same, although many others have an additional molar on each side of each jaw; but in many, the great size of the canine teeth is a marked brutal characteristic. The digestive organs are generally very similar to those of man, but in some of the *simiadæ*, more exclusively confined to vegetable food, there is a remarkable difference in a peculiar and very complicated structure of the stomach. The food of monkeys consists chiefly of fruits, corn, and other vegetable substances; but most of them also catch and eat insects, and even birds, of the eggs of which they are also very fond.

In captivity they learn to eat and drink almost everything that is used by man, and show a great fondness for sweet things, and for alcoholic liquors. The skin of monkeys is generally covered in all parts with hair, but some have the face partially naked, and many have naked callosities on the buttocks. Many have capacious cheek-pouches, in which they stow away food which they cannot consume with sufficient expedition. They are mostly gregarious, although to this there are some exceptions. Many of the species display strong attachment to their mates and to their offspring. One or two young are generally produced at a birth. They display a remarkable propensity and talent for imitation; and this, with their extreme agility, their curious prying disposition, and their love of trick or mischief, makes them very amusing, whether in a wild or a captive state. Many of the stories told of monkeys manifest also a high degree of intelligence, although it may be doubted if the intelligence of any of the species exceeds that of the dog or the elephant. Notwithstanding their resemblance to the human form, their imitative propensity, and their intelligence, none of the monkeys show the smallest capacity for imitating the human voice; and their "chattering" is very unlike articulate speech.

The species of this family are very numerous, but are all confined to the warm parts of the world; Australia, however, and the South Sea islands being destitute of them. They are divided into a number of genera, some of which belong exclusively to particular portions of the world. But in this respect, the most remarkable circumstance is the difference between those of the old world and those of America, the geographical distribution corresponding with the division of the family into two principal groups—the monkeys of the old world (*Catarrhini* of some naturalists), to which alone the name *simiadæ* is sometimes restricted, having the nostrils separated only by a narrow septum, and the tail wanting, short, or long, but never prehensile; the monkeys of the new world (*Platyrrhini*), the family *cebidæ* of some naturalists, having the nostrils widely separated, the tail always long, and often prehensile, most of them having also the four additional molar teeth already noticed, which none of the monkeys of the old world possess; but none of them having cheek-pouches, which many of the monkeys of the old world have. The most interesting genera and species of monkey are noticed in separate articles.

MONKEY POTS. See LECYTHIDACEÆ.

MONK'S-HOOD. See ACONITE.

MONK'S RHUBARB. See DOCK.

MONMOUTH, a maritime co. in the w. of England, bounded on the s. by the estuary of the Severn, on the w. by Glamorgan, and on the e. by Gloucestershire. Area, 368,399 acres. Pop. '71, 195,448. The chief rivers are the Usk, the Wye on the eastern border, and the Rumney on the western border—all of which flow s. into the estuary of the Severn. The coast-line, 22 m. in length, is indented only at the mouth of the Usk (which is navigable for vessels of the largest size to Newport), and at the mouth of the Wye, which vessels ascend to Chepstow. The surface is elevated in the n. and n.w. (the Sugar-loaf is 1856 ft. high), but the coast districts, comprising the Wentloog and the Caldecot levels, are low and rich, and are protected from the wash of the sea by sea-walls and earthworks. In the fertile valleys of the Usk and Wye, wheat is the principal crop; but in the less favored localities, barley and oats chiefly are grown. Coal, limestone, and ironstone abound in the mineral district of Monmouth, in the n.w. of the country. This district, comprising 89,000 acres, abounds in collieries and ironworks, and is a perfect network of railways. Monmouth was a Welsh county until the reign of Henry VIII., but the ancient language is now heard only in a few western districts. The scenery of this country is unusually beautiful; and in no part of England are to be found so many remains of feudal castles as in the eastern districts of this county. The chief remains are Raglan, Caldecot, and Chepstow castles; and Llanthony and Tintern abbeys (q.v.). Roman antiquities are numerous. The county sends two members to parliament.

MONMOUTH, a co. in e. central New Jersey, bounded on the e. by the Atlantic, and n. by Sandy Hook and Raritan bays; drained by the Neversink, Shrewsbury, Shark and Tom's rivers, and intersected by the Central New Jersey, New Jersey Southern, and Freehold and Jamesburg Agricultural railroads; about 500 sq.m.; pop. '80, 55,535—4,712 of foreign birth. The surface is very level, sandy near the sea, but fertile in the interior; potatoes, wheat, oats, butter, and hay are the staples; of potatoes, the annual yield is over a million bushels. Long Branch (q.v.), a fashionable watering place, is situated on the coast of this county.

MON'MOUTH, a parliamentary and municipal borough and market-town of England, capital of the county of the same name, stands, amid beautiful scenery, at the confluence of the Monnow and the Wye, 21 m. w.s.w. of Gloucester. Its church, dating from the 14th c., is surmounted by a lofty spire. Of its castle, the favorite residence of John of Gaunt, and the birthplace of Henry V., the ruins only remain. A building, said to be the study of Geoffry of Monmouth, is all that exists of the Benedictine monastery. Railways connect the town with Newport on the w. and Ross on the e. Ironworks employing a number of workmen, are in operation. Pop. (1871) 5,879. Monmouth unites with Newport and Usk in sending a member to parliament.

MONMOUTH, a city in Illinois, at the junction of the Chicago, Burlington and Quincy, and the St. Louis, Rock Island, and Chicago railroads; pop. '70, 4,662. It is the county seat of Warren co., in a fertile agricultural region, where beds of bituminous coal are found. It is 15 m. s.w. of Galesburg, 28 m. n.e. of Burlington, Iowa, and 47 m. s. of Rock Island. It is the seat of Monmouth college (United Presbyterian), open to both sexes, organized 1853, having a library of 1850 vols.; also of the theological seminary of the northwest, organized 1839, having a library of 2,442 volumes. It has a commercial college, a public library, an academy, excellent public schools, 5 hotels, 3 national banks, 9 churches, public halls, a court-house, and a fine opera house. There are 3 newspapers, 2 monthly magazines and two grain elevators. It has flour and planing mills. Its leading industries are the manufacture of agricultural implements, woolen goods, machinery, files, furniture for churches and schools, carriages, etc.

MONMOUTH, James, Duke of, natural son of Charles II., was born at Rotterdam in 1649. His mother, Lucy Walters, according to Evelyn, a "browne, beautiful, bolde, but insipid creature," came to England with her son in 1656, during the commonwealth. She is said to have been treated as though she had been the king's wife, and was committed to the Tower; but was soon allowed to retire to France, where she died. Charles sought out the boy, and committed him to the care of Lord Crofts, who gave him his own name. On the restoration, Monmouth, then "Mr. James Crofts," came to England with the queen-dowager, and was handsomely lodged at Hampton Court and Whitehall. These honors were, in after years, referred to by his followers as justifying their belief that he was indeed the king's legitimate son. A wealthy heiress, Anne, daughter of the earl of Buccleuch, was selected for his wife; and before he had completed his 16th year, he was married to her, and was created duke of Monmouth. About the year 1670, Shaftesbury put Monmouth forward as the head of the popular party, and rival of the duke of York (afterward James II.). At the period of Titus Oates's plot (1678), rumors that the "Protestant Duke" was indeed the king's legitimate son spread far and wide. The duke of York was compelled to quit the kingdom; and parliament brought forward a bill for excluding him from the succession, when Charles suddenly dissolved it. A document was at the same time issued by the king, solemnly declaring that he had never been married to Lucy Walters. Monmouth was sent into Scotland, in 1679, to quell the rebellion. He defeated the Covenanters at Bothwell Bridge; but his humanity to the fleeing and wounded was so conspicuous, and his recommendations to pardon the prisoners was so urgent, as to bring upon him the violent censures of the king and Lauderdale. He thus became the idol of the English Nonconformists. The return of the duke of York, and the exile of Monmouth, soon followed. In Holland, he allied himself to the leaders of the Nonconformist party, exiled like himself; and when he was allowed to return to London, he was received with such demonstrations of joy, that Monmouth felt that he was the people's choice. In 1680, he made a semi-royal progress through the w. of England, with the design, probably, of courting the Nonconformists, who were more numerous there than in any other part of the country, except London and Essex. In 1682, he traversed some of the northern counties. The king and his brother were alarmed; and Monmouth was arrested at Stafford, and bound over to keep the peace. He meanly confessed his participation in the Rye-House plot, accusing himself and others of a design to seize the king's person, and subvert his government. The king pardoned him, on his solemn promise to be a loyal subject to the duke of York, in case the latter should survive the king. In 1684, Monmouth fled to Antwerp, and remained abroad until the death of the king, when he resolved to embark for England. He landed (June 11, 1685) at Lyme-Regis, and issued a manifesto declaring James to be a murderer and usurper, charging him with introducing popery and arbitrary power, and asserting his own legitimacy and right by blood to be king of England. He was received with great acclamations at Taunton, where he was proclaimed as James II. At Frome, he heard the news of the defeat of Argyle, who, at the head of the Scottish exiles, had attempted to raise an insurrection in Scotland. Money and men were now abundant; but arms were wanting, and thousands went home for want of them. On July 5, he was persuaded, with only 2,500 foot and 600 horse, to attack the king's forces, which, under the command of the earl of Faversham, were encamped at Sedgemoor, near Bridgewater. Monmouth's troops were unable to cross a running stream or wide ditch which protected the camp, and were mowed down by the king's artillery. Their ammunition soon failed; and Monmouth having set a cowardly example of flight, his troops were slaughtered like sheep. About 300 of Monmouth's followers fell in the battle; but 1000 were massacred in the pursuit. Monmouth was found concealed in a ditch, and was brought to London. He made the most humiliating submissions, and obtained a personal interview with James. "He clung," says Macaulay, "in agonies of supplications round the knees of the stern uncle he had wronged, and tasted a bitterness worse than that of death, the bitterness of knowing that he had humbled himself in vain." Even his prayer for "one day more," that he might "go out of the world as a Christian ought," was brutally refused. On June 15, he was brought to the scaffold, and beheaded on Tower Hill; the executioner performing his office so unskillfully that five blows were struck before the head was severed. The "Bloody Assize" afterwards commenced under judge Jeffreys, when Monmouth's adherents paid a fearful penalty for their participation in his rash and ill-advised rebellion.

MONMOUTH, Battle of, so-called, though the battle occurred at Freehold, N. J., which is in Monmouth co., and which point sir Henry Clinton had reached, after his evacuation of Philadelphia, when attacked by gen. Washington's little army. The battle took place June 28, 1778, and was opened by gen. Lee, who commanded the advance of the American force, numbering about 4,000 men. Lee's attack was met by more serious resistance than he had anticipated; or, probably, his raw and worn-out volunteers, who had hardly yet recovered from the terrible winter at Valley Forge, were in no condition to fight the British veterans. A rout of the Americans was the result, and they fell back on the main body, which was commanded by Washington in person. The latter was enraged at seeing the disorderly retreat, and upbraided Lee in the most violent and bitter manner. He then took command himself, rallied the fugitives, and a sharp engagement commenced. The American force was advantageously posted on a height, protected by marshy ground, and where they could use their artillery with good effect. Lee was permitted to resume command of his men, and succeeded in holding his position until ordered at last to retire, which he did in good order. The left of the American line was commanded by lord Stirling, and here some sharp fighting took place, the British making strenuous but inadequate efforts to turn it. Failing in this, they directed their attention to the American right, under Greene, with Wayne posted in good position in an orchard, where he succeeded in keeping up a galling fire upon the enemy, under cover of the trees. The latter made every effort to oust the Americans from this position; and here col. Moncton fell at the head of his grenadiers while making an attack. It becoming evident to the British commander that the Americans were too strongly placed to be dislodged, he ordered his men to fall back. The battle ended with this movement, the Americans not being strong enough to follow up their slight advantage; and during the night the British made a hurried retreat, undiscovered. This was one of the occasions during his life when gen. Washington completely lost his temper: and for the error or cowardice which occasioned this, Lee was court-martialed, and his command was taken from him for one year.

MONNIER, Henri Bonaventure, b. Paris, 1799; educated in Paris, and taking up the pencil and pen after essaying trade. In 1825 his pen-sketches had already attracted much attention, and he increased the reputation of his work by its circulation through the then new art of lithography. In 1826 he illustrated the poems of Béranger and the fables of La Fontaine, and increased his reputation for the creation of character types. After becoming famous for this work, he began to write laughable mimicries of humorous scenes in the lives of the people of the street, of which his works published in 1830, entitled *Scènes Populaires* and *Mémoires de Joseph Prudhomme*, are examples. In 1831 he became an actor at the *théâtre de Vaudeville*, where his original humor as an actor made him a great favorite, excelling particularly in the representation of scenes of his own creation, which were introduced in the first play in which he took part, entitled *Famille Improvisée*. His ambition was soon sated with success as an actor, and his pen resumed work on comedies that needed no stage to enhance their effect, and which have become classic among the French. Among them are: *Un Voyage en Hollande; Les Bourgeois de Paris; Roman chez la Portiere; Le Bonheur de Vivre aux Champs; Peintres et Bourgeois;* and *Les Métamorphoses de Chamoiseau*, several of which are adapted to the stage.

MONNIER, Marc, b. in Italy, 1828; became a resident of Paris, where he was a student of history, literature, and manners; and published esteemed works both in prose and verse. Lately he has been one of the editors of the *Journal des Debats*. Among his historical works are: *La Conquête de la Sicile par les Saracens*, 1847; *Protestantism en France*, 1854; *L'Italie, est elle la Terre des Morts?* 1859; *Garibaldi, Histoire de la Conquête des Deux Siciles*, 1861. Of works of another character are: *La Vielle Fille; La Tante Jeanne; Les Amours Permise.* Of comedies and *marionettes* are *Le Roi Babolein; Le Curé d'Yvetot; La Ligne Droite; Mouche du Coche;* and *Aïeux de Figaro.* A volume of his poems was published in Paris in 1871.

MONO, a co. in e. California, between Nevada and the Sierra Nevada mountains; 4,176 sq.m.; pop. '80, 7,499—4,081 of American birth. The surface is irregular, intersected by numerous mountain offshoots and hills, between which are arable valleys. Some of the plain country is adapted to grazing. Much of the county is heavily wooded with spruce and pine. Owen's river flows through the s., and the branches of Walker's river through the north. Gold and silver are found in paying quantities in the n.w. part. Wheat is being cultivated with success, and there are saw and quartz mills. Capital, Bridgeport.

MONOCENTRIS JAPONICUS, a species of fish which is an inhabitant of the Chinese and Japanese seas, for which a family, *monocentridæ*, and a genus *monocentris*, have been created. It belongs to the order *teleostic*, sub-order *acanthopteri*. It has a compressed, somewhat oblong body, with large scales in the form of osseous plates; eyes large and lateral; teeth villiform, both on jaws and palate bones; branchiæ large; dorsal fins two, first one very spiny, having but little connecting membrane; the second dorsal fin opposite the anal, and similar. The ventral fins each have a single strong spine and two or three short rays.

MO'NOCHORD, an apparatus constructed to exhibit the mathematical proportions of musical intervals. It consists of a flat board of 4 or 8 ft. long, better 16 ft. where space can be spared. The breadth of the board is according to the number of the strings, which are from 2 to 6. The board is covered with fine white paper. A straight line is drawn from end to end below each string, and each line is accurately divided into the different proportions into which the full length of the string, as a fundamental sound, harmonically divides itself. See HARMONICS. The string is fixed at one end, and rests on a bridge; while at the other end, where it also rests on a bridge, it is stretched by a tuning-peg, or by a weight. The sounds from the strings are produced by a violin-bow. The monochord is chiefly used in illustrating acoustical experiments in the proportion of intervals and temperament.

MONOCOTYLED'ONOUS PLANTS, plants in which the embryo has one and only one cotyledon (q v.). The cotyledon in these plants varies extremely in form, and is often comparatively of great size, but has always a slit, from which, as germination takes place, the gemmule sprouts. The gemmule in elongating assumes an acuminated shape. Monocotyledonous plants are all endogenous (q.v.); except the dictyogens (q.v.), in which the endogenous structure is not perfectly exhibited. They are also *endorhizal* (Gr. *endon*, within, *rhiza*, a root); that is, the radicle is covered with a cellular sheath, and gives rise to fibrils similar to itself in structure. The leaves are generally sheathing at the base, and there embrace the stem; they also generally have simple parallel nerves connected by cross veins, the leaves of dictyogens alone being reticulated. The number of the parts of the flower is generally 3, or a multiple of 3. The floral envelopes, often splendid, as in lilies, tulips, etc., are generally united as a perianth (q.v.), instead of forming a distinct calyx and corolla. The principal natural orders of monocotyledonous plants are grasses, *cyperaceæ*, palms, orchids, *scitamineæ*, *musaceæ*, *liliaceæ*, and *iridaceæ*. The general appearance of monocotyledonous plants distinguishes them almost as perfectly as any structural characters.

Of the fossil remains of the vegetable kingdom, the smallest portion consists of monocotyledonous plants, both acotyledonous and dicotyledonous plants being much more abundant.

MONOD, ADOLPHE FREDERIC THEODORE, 1802–56; b. Copenhagen. His father, Jean, residing in Paris as pastor of a French Protestant church, the son was educated at the college Bonaparte, Paris, and then studied theology at the university of Geneva, remaining till 1824. In 1825 he visited Italy, and preached to a small Protestant congregation at Naples until 1827. Returning, he was appointed pastor of Lyons, but, his evangelical and earnest preaching being disliked, he was removed. His congregation then met in a private room, and soon in a spacious chapel, and at the end of 30 years the evangelical church of Lyons had 4 pastors, many evangelists, and 8 chapels. He was appointed by the government professor of theology at Montauban, where he remained 11 years. While filling this office he traveled in southern France, preaching and instructing the people, who were attracted by the power of his discourses. Though holding the views of his brother in regard to the divinity of Christ, he remained in the national church, and in 1849 succeeded his brother as pastor at Paris, being appointed by the consistory of Paris, the government confirming the selection. The large oratoire was filled every Sunday, and the small room was used for Bible lessons, many preferring these to his greater sermons. In 1856 he was suddenly stricken down, and his disease pronounced incurable. He was a man of great spiritual power, a sympathizing heart, highly cultivated mind, and lofty imagination. He was an eloquent preacher. His literary works were chiefly sermons. In 1844 he published a volume of sermons of 68 pages, which are considered very valuable. He is the author of *Lucile, ou la Lecture de la Bible; La Femme; Saint Paul.*

MONOD, FRÉDÉRIC JOËL JEAN GÉRARD, 1794–1863; b. Monnaz, canton de Vaud, Switzerland; educated at Geneva; entered the ministry in 1820, and succeeded his father as pastor of the national Protestant church of France in Paris. He established in 1824 the *Archives du Christianisme*, the chief organ of the evangelical French Protestants, and continued its editor until his death. After officiating 12 years as pastor of the oratoire, he united with De Gasparin and others in an attempt to restore a rule of faith in the reformed church which would exclude rationalists, by making an acknowledgment of the divinity of Christ essential to membership. Failing in this, they left the national Protestant church in 1849, and organized independent congregations which resulted in the formation of the Free evangelical church of France. Associated with Monod were count de Gasparin, E. de Presseusé, and pastor Fisch. The influence of the Free church has been so great that the majority of the state church are now represented to be evangelical. In 1858 Monod visited the United States to interest the churches here in their new movement. He greatly admired American institutions, and referred to this country as evidence of the advantage of entire separation of church and state. During the war of the rebellion, he ardently espoused the side of the national government, and was one of the originators of the address which was signed by the majority of the Protestant

French ministers, declaring that "the triumph of the rebellion would throw back for a century the progress of Christian civilization and of humanity, raise the hopes of the favorers of slavery and the slave trade, and would give a sad blow to the work of evangelical missions." The address produced a marked change of opinion towards the United States not only in France, but also in England. He published a few pamphlets and several sermons, but most of his writings are in the *Archives du Christianisme.*

MO'NODON. See NARWHAL.

MONŒ'CIOUS (Gr. *monos*, one, and *oikion*, a habitation), the term used in botany to describe those plants which have the male and female parts of fructification (*stamens* and *pistils*) in different flowers, but upon the same plant. The flowers of such plants are also said to be *monœcious.* Monœcious plants form one of the classes of the Linnæan artificial system, but many occasional instances of monœcious species are to be found in genera belonging to other classes. Monœcious plants often have the flowers in catkins, sometimes the male flowers only; and often in spikes, the male flowers sometimes occupying the upper, and sometimes the under part of the same spike with the female flowers, and sometimes distinct spikes upon the same plant. Common examples of monœcious plants are the hop, box, birch, beech, alder, oak, and hazel.

MONOGRAM (Gr. *monos*, alone, and *gramma*, letter), a character composed of two or more letters of the alphabet, often interlaced with other lines, and used as a cipher or abbreviation of a name. A perfect monogram is one in which all the letters of the word are to be traced. The use of monograms began at a very early date. They are found on Greek coins, medals, and seals, and are particularly numerous on the coins of Macedonia and Sicily. Both on coins and in MSS. it was the practice to represent the names of states and cities by monograms, of which above 500 are known, but some have not been deciphered. Monograms occur on the family coins of Rome, but not on the coins of the earlier Roman emperors. Constantine placed on his coins one of the earliest of Christian monograms, which is to be traced in the recesses of the catacombs, composed of the first and second letters of *XPιστος* (Christus), a monogram which also appeared on the Labarum (q.v.), and was continued on the coins of the succeeding emperors of the east down to Alexander Comnenus and Theodorus Lascaris. We often find it combined with the first and last letters of the Greek alphabet (Rev. i. 8). Another well-known monogram is that of the name of Jesus, IHS, from the first three letters of *IHΣοῦς*.

Popes, emperors, and kings of France during the middle ages were in the practice of using a monogram instead of signing their names. Almost all the coins of the French kings of the Carlovingian race bear their respective monograms, as also do those of Alfred and some of the other Saxon kings of England.

Painters and engravers in Germany and Italy have used monograms to a large extent as a means of distinguishing their works. In these, the initial letters of their names were often interwoven with figures of a symbolical character, so as to form a rebus on the artist's name. The first typographers distinguished their publications by wood-cut vignettes, whose invention is ascribed to the elder Aldus; but besides these, each made use of a monogram or cipher, a series of which, well known to the bibliographer, fixes the identity of the ancient editions, German, Italian, and English, from the invention of printing down to the middle or end of the 16th century. For a detailed account of the monograms of early printers and others, see Brulliot, *Dictionnaire des Monogrammes* (Munich, 1832–34): Horne's *Introduction to Bibliography*, vol. ii.; and Herbert's and Ames's *Typographical Antiquities.*

MONOGRAPH, a work in which a particular subject in any science is treated by itself, and forms the whole subject of the work. Monographs are entirely of recent date, and have contributed much to the progress of science. In botany especially, monographs of orders and genera are very numerous; and some of them are among the most splendid and sumptuous of scientific works.

MONO LAKE, in Mono co., Cal.; 14 m. long. Its waters are very alkaline and bitter. It has no outlet.

MONOLITH, a monument, column, obelisk, statue, or other structure formed of a single stone. In India there are examples of monolithic temples, the whole being cut out of the solid rock.

MONOMA'NIA has loosely been made to represent every form of partial insanity; but has been more rigidly defined as that mental condition in which a single faculty, or class of faculties or associations, become diseased, the mind generally remaining healthy. Slight and solitary aberrations, such as where a savage antipathy to cats coexists with a love for human kind; where there appears to be an incontrollable tendency to steal, to squander, to drink, to destroy, are of common occurrence, and are supposed to be compatible with the exercise of intelligence, and with the discharge of many of the ordinary duties of life. By a more strict limitation, the term has been confined to such affections as involve the emotions and propensities alone. It is, however, held that, notwithstanding its apparent integrity, the whole mind is involved or influenced by the presence of such morbid conditions, at least while they are predominant. It is undoubtedly difficult to point out in what manner the belief, e.g., that a particular organ has been transmuted into glass, can interfere with or render the memory, or the power of instituting comparisons, defective and untrustworthy; yet it is legitimate to receive with caution *every* manifestation of powers so constituted that they fail to detect the incongruities and absurdities with which they are associated; or, having detected the real character of these errors, are unable or unwilling to cast them out, or to disregard them. There is much countenance given to this theory by facts which indicate that even trivial forms of mental obliquity are connected with an unsound organization; and that particularly and rarely recognized monomanias are invariably associated with the *same* structural alteration. The unhealthy elevation of the sentiment of cautiousness, for example, especially where it amounts to fear of death, panic, or panphobia, is a symptom of disease of the heart and large blood-vessels; while the monomania of ambition, or optimism, as it has been styled, is the concomitant of the general paralysis of the insane. It will be obvious, from the definitions previously introduced, that the species or varieties of monomania must correspond to the faculties or phases of the human mind, and to their combinations. Several great divisions, however, have been signalized, both on account of their frequency and of their influence upon the individual and upon society. 1. Monomania of suspicion, comprehending doubts in the fidelity and honesty of friends and those around, belief in plots and conspiracies, the dread of poison; and where, as is often the case, it is conjoined with cunning, the propensity to conceal, mystify, and deceive. This malady has frequently been observed in intimate connection with cancer and malignant growths. 2. Monomania of superstition and unseen agencies, where credulity, mingled with religious awe, peoples the external world with specters, omens, mysteries, magnetism; and the imagination with horrors or ecstatic reveries. Insensibility to pain, or indifference to external injuries, has been observed as a characteristic of individuals affected with this disease. 3. Monomania of vanity, or euphoria, where display and ostentation are indulged, without reference to the position and means of the patient. 4. Monomania of fear. 5. Monomania of pride and ambition. 6. Kleptomania (q.v.). 7. Dipsomania (q.v.). If it can be proved that such morbid tendencies, as have been here mentioned, and others still less prominent, are merely salient points of a great breadth and depth of mental disease, the plea of insanity may justifiably be employed more frequently in the consideration of criminal acts.—Esquirol, *La Monomanie;* Bayle, *Maladies du Cerveau;* Stephens's *Criminal Law of England*, p. 92.

MONOMOISE or MONOMOEZI, a country in central Africa, on the e. shore of lake Taganyka. It was known in the 16th and 17th centuries as Monemuge or Munhemuge, though all these names are said to apply properly to the ruler of the country, and not the country itself. The name is little used at present, and the territory is split into a number of small kingdoms. Its former area was estimated at 240,000 sq. miles. Its inhabitants were continually at war, but higher in civilization than most South African tribes. Ivory, copper, cotton, and oil are exported by means of caravans.

MONONA, a co. in w. Iowa, on the Missouri; 730 sq.m.; pop. '80, 9,055—7,868 of American birth. The Little Sioux river flows through it. It is chiefly fertile prairie. Indian corn, wheat, and oats are raised. Co. seat, Onawa.

MONONGAHE'LA, a river which rises in the Alleghany mountains in Virginia, United States of America, and flowing n. into Pennsylvania, unites with the Alleghany at Pittsburg to form the Ohio. Its whole length is 300 miles. It is navigable for steam-boats to Brownsville, 60 m., with dams and locks for low water. Vast seams of coal open in its high banks, from which flat boats are loaded, and floated down with the current through the Ohio and Mississippi.

MONONGALIA, a co. in n. W.Va., next to Pennsylvania; 500 sq.m.; pop. '80, 14,985—317 colored. The surface is irregular, and Laurel hill, a w. offshoot of the Alleghanies, traverses the e. part. The soil is rich, and produces good crops of Indian corn, wheat, oats, and potatoes. The Monongahela and Cheat rivers flow through it. There are large forests, and deposits of bituminous coal. Co. seat, Morgantown.

MONOPE'TRAL, a temple formed of an open circle of columns carrying a roof, and without a cell.

MONOPHYSITES, the name given to a widely ramified sect of Christians who hold that Christ has only *one* nature (Gr. *monos*, one; *physis*, nature), a human nature become divine. Monophysite views were first decidedly put forward in the controversy against Nestorius. Cyril having expressed the opinion that the flesh of the Logos was essential to his personality, the archimandrite Eutyches (q.v.) went on to assert a deification or apotheosis of the flesh of Christ, and obtained the consent of a synod at Ephesus, in 449, commonly called the "synod of robbers," to this doctrine; but he and his adherents (at first called after him EUTYCHIANS) were condemned as heretics by the council of Chalcedon in 451. It was after this council that the name *Monophysites* began to be used. The decision of the council, however—viz., that in Christ *two* natures, neither interfused, changed, nor divided, were united in *one* person, and constituted *one* hypostasis—was not calculated to allay, but rather to increase discord. Accordingly, the strife grew hotter. The Asiatic and Egyptian clergy, strongly opposed to Nestorianism, were generally inclined to Monophysite views, and received countenance from the emperor Basiliscus. After long, and often bloody contests between the supporters of the opposite opinions, the Monophysites, formerly separated from the orthodox church. This separation took place in the first half of the 6th c., when the imperial protection hitherto bestowed upon them was lost by the alliance of the emperors Justin and Justinian with the Latin church. Besides, they had not maintained unity among themselves. As early as 482, when the emperor Zeno published his famous *Henoticon*, or formula of concord, it was accepted by several of the more moderate Monophysites. This roused the indignation of the extremer sectaries; they renounced fellowship with their laxer brethren, and formed a sect of their own. They were called *Akephaloi*, and formed the *ultras* among the Monophysites. Controversies arose also in 519 on the question, whether or not the body of Christ was corruptible. The Severians—adherents of Severus, a deposed bishop of Antioch—affirmed that it was; the Julianists, or Gajanites, followers of bishop Julianus or Gajanus, denied it. The former were consequently called (Gr.) *Phthartolatrists*, (Lat.) *Corrupticolæ* (worshipers of the corrupt); the latter, *Aphthartodocetæ* (believers or teachers of incorruption), and sometimes—as an incorruptible body could only be apparent, and not real—*Phantasiasts*. The *Aphthartodocetæ* split again on this other point—whether or not Christ's body was created; the *Aktistetoi* (Gr. *ktizo*, to create) asserting that it was not created, and the *Ktistolatrists*, that it *was*. The Severians, called also, after one of their bishops, *Theodosians*, finally got the the upper hand, and excommunicated their opponents, including another sect, the *Agnoetoi*, who denied that Christ as a man was omniscient. About 560 the Monophysite Askusnages, and after him the Christian philosopher Philoponus, ventured to speak of the three persons in the Godhead as three gods. This, however, was reckoned heretical even by the Monophysites themselves, and was the occasion of a large recession to the bosom of the Catholic church. Monophysite communities continued strongest in Egypt, Syria, and Mesopotamia, where they maintained a regular ecclesiastical order under their own patriarchs of Alexandria and Antioch; and after the Syrian, Jakob Baradæus (Al-Baradai, died about 578), had drawn up for them an ecclesiastical constitution, they formed the independent churches of the *Jacobites* (q.v.) and *Armenians*. See ARMENIAN CHURCH. The Coptic and Abyssinian churches are also Monophysite in doctrine.

MONOP'OLI, a t. of southern Italy in the province of Bari, situated on the Adriatic shore, in a pleasant and healthy plain, 28 m. e.s.e. of Bari. Pop. about 20,000. It is supposed to be of Grecian origin, the name in Greek signifying the *solitary city*. It is surrounded by walls, and has a fortress constructed in 1552 by Charles V. The neighboring territory yields an immense quantity of olive oil.

MONOPOLY, from the Greek, signifies sole selling or individual selling, and has always been used to express a limitation to one or more persons of the right or power to conduct business as a trader. It is generally used in a bad sense to express something injurious, but economic science has lately very much narrowed the field over which its injurious character is supposed to extend. In the first place, it must be created by force; if it come in the natural course of trade, it is generally beneficial. Thus, to a village where three or four traders have conducted a small lazy business, drawing large profits, there comes a capitalist, who sets up a large concern on the ready-money system, and, by selling good articles at a low rate, absorbs all the business. He is of course abused as a monopolist by the ineffective persons he has superseded; but his presence is a blessing to the community generally. If, however, he had gone to the village, not to compete with others, but with a royal patent in his pocket securing to him the exclusive trade of the village, as he could sell at his own price, and make a fortune without trouble, he would of course be, like the old royal monopolists, a calamity to the people.

A careful distinction must be preserved between monopoly and property—that is to say, an exclusive right to *trade* must be separated from an exclusive right to *possess*—for, while the law of property exists, possession will always be exclusive. If, then, a trade can only be conducted with large capital, it must fall to those who either singly, or by co-operation, can command that capital; and the answer to all complaints on the part of others is, that since capitalists can best serve the public, it is best for the public that capitalists should be allowed to do so. The old corn-laws and landed property conjoined to produce one of the best illustrations of the distinction. The power of producing grain within Britain has always been of necessity limited to those who have, either as owners or tenants, the command of the land. Forfeit all the land in the country to-morrow, and proclaim the production of grain to be free, the result would only be a change of ownership; for those who by their good-luck, or more probably by their power, got hold of rich old wheat-lands, would produce their grain much cheaper than those who got the poor lands, and, selling the produce at the same price, would pocket the difference, which would, in fact, just be rent gained by them as the new landlords. But when dealers offered the people grain from abroad, and the corn-laws rendered it impossible to sell that grain in this country, then there was a monopoly in favor of the home-producer, having the effect of artificially raising prices, and otherwise disturbing trade.

A deal of legislation was wasted by our ancestors in enactments to prohibit people from creating monopolies by that fair competition which is now considered the true healthy development of trade. Some account of them and of their repeal will be found in the article ENGROSSING. When British trade was increasing in the 16th c., it found some old powers alleged to be inherent in the royal prerogative for conferring exclusive trading rights, which led to much oppression and loss. In queen Elizabeth's parliament of 1597 a complaint was made that, for the benefit of favored courtiers, oppressive monopolies had been granted, not only for the sale of foreign luxuries, but for salt, leather, coal, and other articles of ordinary consumption. Queen Elizabeth said she "hoped her dutiful and loving subjects would not take away her prerogative, which is the choicest flower in her garden, and the principal and head pearl in her crown and diadem." Parliament returned to the charge, however, in 1601, when, on the reading over of the list of monopolies, a theatrical scene occurred by a member calling out: "Is not bread among the number?" and on this producing a sensation, continuing: "Nay, if no remedy is found, bread will be there before the next parliament." In 1621 parliament took proceedings against sir Giles Mompesson, charged with an oppressive use of his patent's monopoly. Four years afterwards, an act was passed limiting this power in the crown. It leaves only the right to grant a limited monopoly in the manufacture of his invention to any inventor, and this is the origin of the present patent law. See Patent.

MONOPTERUS JAVANENSIS, a peculiar species of eel found in the East Indian seas and along the coasts of China and Japan. It has a more elongated body than most eels; teeth small and embraced in a narrow band; branchial apertures meet in a median slit beneath; no caudal or pectoral fins; dorsal and anal fins rather small; branchial arches have rudimentary laminæ. It has about 188 vertebræ and is 3 ft. or more in length.

MONOS'TOMA, a genus of trematoid worms, so called from having only a single sucker, which is situated anteriorly, and surrounds the mouth. It belongs to the *trematoda digenea* (of Van Beneden), all of which present the phenomena of alternation of generations, the earlier or larval forms occurring chiefly in molluscs, while the perfect worms are found, for the most part, in vertebrated animals. Among the species of this genus occur *M. flavum*, found in water-fowl (the larva being the *cercaria ephemera*, which is common in *planorbis*, etc.), *M. mutabile*, found in various birds, and *M. lentis*. The last-named species derives its specific name from its having been found by Van Nordmann in a lens extracted in a case of cataract. Cobbold and other distinguished helminthologists are inclined to believe that this is not an independent species, but that it is identical with the *distoma ophthalmiobium* of Diesing.

MONOTHEISM, the term usually employed to denote a belief in the numerical unity (*unus numero*) of the Godhead, or belief in and worship of one God. It is thus the opposite of *polytheism* (q.v.). See God. The "doctrine of the Trinity" is thought by some to be incompatible with the monotheism taught by Jesus Christ, and is therefore rejected as no part of his teaching. See Unitarians. Mohammedans and Jews hold the doctrine of the "unity of God," even more rigorously in some respects than modern Christians: at least they reject with vehemence the least approach to a Trinitarian conception of the Deity. The majority of mankind are polytheists.

MONOTH'ELISM (Gr. *monos*, single, and *thelein*, to will), a modification of Eutychianism, which was introduced after the condemnation of that doctrine by the council of Chalcedon. It consisted in maintaining that, although Christ had two natures, yet these natures possessed or acted by but a single will, the human will being merged in the divine, or absorbed by it. The author, or at least the most active propagandist of this doctrine, was Sergius, patriarch of Constantinople, who obtained for it the support of the emperor Heraclius; and its progress was materially forwarded by the silence which, at the instance of Sergius, and under his representations, the pope, Honorius (q.v.), was induced to maintain regarding the question. The doctrine was formally condemned in the sixth general council held at Constantinople in the year 680, with which condemnation it is commonly said that the early controversies on the incarnation were ended. See Eutyches and Monophysites.

MONOTH'ELITES (Monothelism, *ante*), persons in the early church who, in the effort to explain the mystery of Christ's person, said that he possessed only one will. Eutyches, about the middle of the 5th c., had taught that Christ had only one nature, his human nature having been *absorbed* by his divine. The impersonal human nature, he said, was assimilated and, in a manner, deified by the personal Logos, so that his body was not of the same substance as those of mankind generally, but was a divine body. All human attributes, also, in his opinion, were transferred to the one subject, so that it must be said, God was born, God suffered, was crucified, and died. The monophysites, in distinction from the Eutychians, held that the two natures were so *united* as to become only one nature. And these were followed by the monothelites, who maintained that Christ, though retaining two natures, had only one will, the human will being merged in the divine. That is, while speaking of two natures, they were in fact Eutychians so far as respected the faculty of the will. This theory was made prominent in the effort of the emperor Heraclius to compose the disputes in the church, and especially to bring back the Eutychians and monophysites, the latter of whom were very powerful. Their leader, Cyrus, patriarch of Alexandria, called a synod, 633 A.D., which approved the monothelite statement, and with good effects at least for a time. Many Eutychians in Armenia, Egypt, and other remote districts, were brought back to the church. The decision, however, was opposed by Sophronius, a monk of Palestine, who, on being made patriarch of Jerusalem, did not hesitate to resist both the open approval of it by the patriarch of Constantinople and the tacit consent yielded to it by the pope of Rome. He soon summoned a council, which condemned the doctrine of the one will as being a part of the Eutychian heresy. This decision, in its turn, was condemned by the emperor Heraclius, who issued a decree forbidding all controversy on the subject; but his influence in upholding monothelism was soon arrested by his death; and, after much controversy and mutual condemnation, the first synod of the Lateran, 649, adopted the doctrine of the two wills and two energies. The final condemnation of monothelism was pronounced at the 6th general council, Constantinople, 680, where it was declared that there are in Christ two natural wills and two natural operations, without division, conversion, or change; with nothing like antagonism or like confusion; but at the same time that the human will could not come into collision with his divine will, but is in all things subject to it.

MONOTREM'ATA (Gr. *monos*, single, *trēma*, an opening), the lowest order of mammalia, in many of their characteristic points indicate an approximation to birds. The skull is smooth; the brain-case very small as compared to the face; the snout much prolonged, and the jaws unprovided with soft movable lips, and not furnished with teeth. (In the ornithorhynchus there are two horny plates in each half-jaw, which act as teeth, while in the echidna even these substitutes for teeth are wanting.) The cranial bones coalesce, as a bird's, at a very early period, and leave no signs of sutures. The external ear is altogether absent; while the eyes, though small, are perfectly developed.

The bones of the shoulder, forming the scapular arch, are unlike those of any other mammals, and in some respects resemble those of birds, and in other respects those of reptiles. At the top of the sternum is a T-shaped bone, formed by the union of the two clavicles, corresponding to the *furculum* in the bird's skeleton. The coracoid bones, which in other mammals are mere processes of the scapula, are here extremely large, and assist, as in birds, in strengthening the scapular arch; while the scapulæ themselves are produced beyond the socket of the humerus (the glenoid cavity), so as to articulate with the sternum.

The pelvis is provided with marsupial bones, although these animals do not possess a pouch.

The feet have five toes, armed with long nails; in addition to which, the hind-feet of the males are provided with a perforated spur-like weapon, which is connected with a gland. The Australian aborigines believe the wounds made by this spur to be poisonous; but there is no scientific evidence of the fact.

The ovaries are analogous to those of birds, the right ovary being comparatively undeveloped, while the left forms a racemiform mass. The orifices of the urinary canals, the intestinal canal, and the generative canal, open, as in birds, into a common cloaca, from which circumstance the order *Monotremata* derives its name. The mammary glands, of which there is only one on each side, are not provided with nipples, but open by simple slits on each side of the abdomen.

This order includes only two or three species, all natives of Australia or Van Diemen's Land, which, however, form two families—the *ornithorhynchidæ* (see Duck-bill), and the *echidnidæ* (see Echidna).

No fossil remains of any animals of this order have as yet been discovered.

MONOTROPA'CEÆ, a small natural order of exogenous plants, allied to *ericeæ* and *pyrolaceæ;* but remarkably differing from both in their habits. They are herbaceous plants with scales instead of leaves, and grow parasitically on the roots of pines and other trees, in the northern parts of the world. The only British species is *monotropa hypopitys*, sometimes called *yellow bird's nest.* The whole plant has a pleasant smell.

MONREA'LE, a city of the island of Sicily, province of Palermo, and 5 m. s.w. of the city of that name, on the flank of a steep hill. Pop. 15,561. It has a cathedral, a palace, several conventual establishments, and possesses a healthy climate. Its chief source of wealth is its export trade in oil, corn, and fruit, almonds being one of its most important products.

MONRO, Alexander, an eminent anatomist, and founder of the medical school of Edinburgh, styled *primus* to distinguish him from his son and successor, was b. at London, Sept. 8, 1697. His grandfather, sir Alexander Monro of Bearcrofts, a colonel in the army of Charles II. at the battle of Worcester in 1651, was afterward an advocate at the Scottish bar; and his father, John Monro, for some years a surgeon in the army of king William, in Flanders, on leaving it, entered into practice in Edinburgh. Alexander studied at London under Cheselden, at Paris under Bouquet, and at Leyden under Boerhaave, and in 1719 passed as a surgeon at Edinburgh. In Jan., 1720, he was elected by the town-council first professor of anatomy in the university. Of the establishment and building of the royal infirmary of Edinburgh, he was one of the two principal promoters, and after it was opened, he delivered clinical lectures there for the benefit of the students. In Jan., 1756, he received the degree of M.D., and in March following was elected a fellow of the royal college of physicians of Edinburgh. In 1759 he resigned the anatomical chair to his youngest son, the subject of the following notice, but continued his clinical lectures at the Infirmary. His principal works are—*Osteology, or Treatise on the Anatomy of the Bones* (Edin. 1726, 8vo); *Essay on Comparative Anatomy* (Lond. 1744, 8vo); *Observations, Anatomical and Physiological* (Edin. 1758, 8vo); and an

Account of the Success of Inoculation of Small-pox in Scotland (Edin. 1765, 8vo). He was secretary of a society at Edinburgh, which published six volumes of *Medical Essays and Observations*, many of them contributed by himself. Two more volumes of *Essays, Physical and Literary*, were subsequently issued by the same society, under the name of the philosophical society. Dr. Monro died July 10, 1767. He was a fellow of the royal society of London, and a member of the royal academy of surgery of Paris.

MONRO, ALEXANDER, *secundus*, an eminent physician and medical professor, youngest son of the preceding, was b. at Edinburgh, Mar. 24, 1733. He studied at the university of that city; and in Oct., 1755, obtained the degree of M.D. In July following he was appointed joint professor of anatomy and surgery with his father in the university of Edinburgh. He attended for some time the anatomical lectures of prof. Meckell at the university of Berlin. He also visited Leyden. Admitted a licentiate of the Edinburgh royal college of physicians, 1758, he was elected a fellow, 1759, and was afterwards president. On the resignation of his father in the latter year, he became full professor of anatomy, and also succeeded him as secretary of the philosophical society, which in 1783 was incorporated by royal charter, and took the name of the royal society of Edinburgh. In 1757 he published at Berlin a short treatise, *De Venis Lymphaticis Valvulosis*, in support of the theory, that the valvular lymphatics over the whole of the animal body are one general system of absorbents; which led to a controversy with Dr. William Hunter, of London. Among his other works are—*On the Structure and Functions of the Nervous System*, a large illustrated folio volume (Edin. 1783); *On the Structure and Physiology of Fishes*, also an illustrated folio volume (Edin. 1785); *Description of all the Bursæ Mucosæ of the Human Body* (Edin. 1788); and *Three Treatises on the Brain, the Eye, and the Ear*, illustrated by plates (Edin. 1797, 4to). He was a member of the royal academies of Paris, Madrid, Berlin, Moscow, and other learned institutions, and one of the first fellows of the royal society of Edinburgh, to whose *Transactions* he contributed various papers. In 1798 his son, Dr. Alexander Monro, *tertius*, was conjoined with him in the professorship; and in 1808 he finally retired from the anatomical chair, and from his extensive practice. He died Oct. 2, 1817, in his 87th year.

MONRO, ALEXANDER, *tertius*, anatomical professor, son of Dr. Alexander Monro, *secundus*, born at Edinburgh, Nov. 5, 1773, was educated at the high school and university of that city, and studied medicine, anatomy, and surgery in London. In 1798 he became joint professor of anatomy with his father, and the following year he took his degree of M.D. In 1803 he instituted the class of practical anatomy in the university of Edinburgh, and in 1808 he succeeded his father in the anatomical chair. In 1828 he was president of the royal college of physicians of Edinburgh, and he contributed many valuable papers to its *Transactions*. He was also a fellow of the royal society of Edinburgh. He retired from his chair in 1847, with the title of emeritus professor of anatomy; and thus ended the connection between the college of Edinburgh and the family of Monro, which lasted for more than a century and a quarter. He died at his seat of Craiglockart, near Edinburgh, Mar. 10, 1859. He was the author of *Observations on Crural Hernia*, plates (Edin. 1803); *The Morbid Anatomy of the Gullet, Stomach, and Intestines*, plates (Edin. 1811); *Outlines of the Anatomy of the Human Body* (4 vols. 8vo, Edin. 1813); and other professional works.

MONROE, a co. in s.w. Alabama, n.e. of the Alabama river; 980 sq.m.; pop. '70, 14,214—14,180 of American birth. The surface is diversified, and much of it covered with a growth of pine. The soil is fertile, and well adapted to the raising of Indian corn, which is the principal crop. Next in importance are sweet potatoes and cotton. Considerable quantities of molasses are manufactured from the cane. It is drained by the Alabama river and Limestone creek. Co. seat, Monroeville.

MONROE, a co. in e. Arkansas, n.e. of the White river, 1040 sq.m.; pop. '80, 9,570—5,160 colored. The surface is even, and a large portion of it is cypress swamps. There are extensive forests of hickory, sassafras, and white oak. The soil is fertile, and produces good crops of Indian corn and cotton. Co. seat, Clarendon.

MONROE, a co. in s. Florida, bounded on the n. by the Caloosabatchie river, on the e. by lake Okeechobee, on the s.w. by Ponce de Leon bay, and on the w. by the gulf of Mexico; 3,060 sq.m.; pop. '80, 10,867—3,208 colored. The surface is flat, with a large area of marsh; a part of the everglades lies in it. Most of the Florida Keys and of the Thousand Isles are within the limits of this county, which is the w. portion of the s. end of the Florida peninsula. Large areas are used for pasturage. Little is under cultivation, and the chief produce is sweet potatoes. Co. seat, Key West.

MONROE, a co. in central Georgia, w. of the Ocmulgee, drained by Tobesofka, Towaliga, and Echeconnee creeks, on the Central railroad of Georgia; 370 sq.m.; pop. '80, 18,808—12,112 colored. The surface is uneven and hilly, and the soil generally fertile. Granite, gold, and iron are found. The principal productions are cotton, Indian corn, wheat, oats, and sweet potatoes. Co. seat, Forsyth.

MONROE, a co. in s.w. Illinois, between the Mississippi and Kaskaskia rivers; 360 sq.m.; pop. '80, 13,682. The surface is somewhat uneven. The soil is fertile, and produces large quantities of wheat, Indian corn, oats, and potatoes. There are a number of flour-mills and harness manufactories. The Cairo and St. Louis railroad passes through it. Co. seat, Waterloo.

MONROE, a co. in s.w. Indiana; area, 420 sq.m.; pop. '80, 15,875—of American birth, 15,577. It is drained by the White river and its tributaries. The surface is uneven, soil fertile, and the principal crops grown are corn, wheat, oats, potatoes, and tobacco. There are a number of saw and flour mills, woolen mills, currying shops, and tanneries. It is on the line of the Louisville, New Albany, and Chicago railroads. Co. seat, Bloomington.

MONROE, a co. in s. Iowa; 430 sq.m.; pop. '80, 13,719—of American birth, 12,227. It is well watered by a number of small streams and creeks. It is largely prairie, with an undulating surface, uneven in some portions. The soil is fertile, and grows large crops of Indian corn. Next in amount are the productions of wheat, oats, butter, hay, and potatoes. There are some saw-mills, flour-mills, and a few smaller manufacturing establishments. It is intersected by the Burlington and Missouri, and Iowa Central railroads. Co. seat, Albia.

MONROE, a co. in s. Kentucky, adjoining Tennessee; 300 sq.m.; pop. '80, 10,742—colored, 660. The surface is uneven. The soil is fertile, and grows, besides tobacco and corn, which are the chief productions, oats, potatoes, and sweet potatoes in considerable quantities. It is watered by the Cumberland river and the source of the Big Barren. Co. seat, Tompkinsville.

MONROE, a co. in s.e. Michigan, along the shores of lake Erie, adjoining Ohio; 540 sq.m.; pop. '80, 33,623. The Huron river flows along its n.e. side. It is watered by the Raisin river, which passes through a fertile valley, with fine scenery. The most important productions are Indian corn, wheat, oats, wool, potatoes, butter, and hay. There are a number of saw-mills, carriage manufactories, and tanneries. There are also flour-mills, brick-yards and manufactories of agricultural tools. The Flint and Pere Marquette, the Lake Shore and Michigan Southern, and the Canada Southern railroads pass through it. Co. seat, Monroe.

MONROE, a co. in n.e. Mississippi, having the state line of Alabama for its e. boundary, and a branch of the Tombigbee river for its s.w., is drained by that river, intersecting it centrally, and traversed by the Mobile and Ohio railroad; 800 sq.m.; pop. '80, 28,553—28,419 of American birth, 18,004 colored. Its surface is generally level, in some localities low and swampy, in others covered with dense forests of hard wood, interspersed with groves of magnolia, tulip-tree, beech, and elm. Its soil is a calcareous loam, very fertile, and adapted to the raising cf live-stock, and the production of wheat, corn, sweet potatoes, cotton, and dairy products. Co. seat, Aberdeen.

MONROE, a co. in n.e. Missouri; 744 sq.m.; pop. '70, 17,149. It is well watered by the Salt river and its tributaries. It is principally a fertile, rolling prairie. Great crops of corn are grown, and wheat, oats, butter, hay, tobacco, and wool, are raised in quantities. Rich veins of coal, limestone, and freestone are found. Agriculture is the principal business, and manufacturing has not been much developed. It is on the line of the Missouri division of the Missouri, Kansas and Texas railroad. Co. seat, Paris.

MONROE, a co. in w. New York, having lake Ontario for its n. boundary; 682 sq.m.; pop. '80, 142,660. It is drained by the Genesee river, the Irondequoit, the Honeoye, and other small streams. It is intersected centrally by the Erie canal, crossing the Genesee river, and the Genesee Valley canal, by the New York Central and Hudson River railroad, the Rome, Watertown and Ogdensburg, and the Rochester division of the New York, Lake Erie and Western railroad. Its surface is generally level, sloping towards the water, and well wooded, Its orchard products are very considerable, and fruit and ornamental trees, apples, and wool are among its exports. Iron is mined; other mineral deposits are Medina sandstone, Silurian limestone, gypsum, and water-lime. Its domestic trade is important and its commercial facilities render its foreign commerce of great value. Its unlimited water power is utilized by factories, and among its vast industries are the manufacture of ready-made clothing, boots and shoes, cigars, hats and caps, steam-engines, bank locks, machinery, etc. At its county seat are the Leighton iron bridge works; and its flour mills grind millions of bushels of wheat annually. Co. seat, Rochester.

MONROE, a co. in s.e. Ohio, on the Ohio river; 420 sq.m.; pop. '80, 26,497—24,500 of American birth. The surface is uneven, heavily wooded, and contains deposits of coal. Iron is found in some parts. The soil is fertile, and the chief staples are tobacco and corn. The productions next in importance are oats, wheat, potatoes, hay, butter, and wool. Large quantities of cheese are manufactured. There are saw and planing mills, tanneries and currying shops, furniture factories and flour-mills. Co. seat, Woodsfield.

MONROE, a co. in e. Pennsylvania, having the Delaware river for its s.e. boundary, separating it from New Jersey, a range of the Blue mountains for its s., and the Lehigh river for its n.w. boundary; about 680 sq.m.; pop. '80, 20,175—19,320 of American birth, 155 colored. It is intersected by the Delaware, Lackawanna and Western railroad. Its fertile valleys are interspersed with elevations in some localities, and diversified by forests of hickory, walnut, etc. It is drained by Brodhead's and Tobyhanna creeks; limestone and slate are quarried. It contains the charming summer resort of Delaware Water Gap, where the Delaware river breaks through the Blue ridge through a gorge two or three miles long, whose sides rise 1400 feet above the level of the water. The surrounding country is noted for its picturesque scenery. Its soil, on a limestone foundation, produces all the vegetable, orchard, and dairy products common to the middle states. Lumber is one of its chief commodities, and leather and flour are manufactured. Among its manufactories are woolen-mills and tanneries. Co. seat, Stroudsburg.

MONROE, a co. in s.e. Tennessee, next to North Carolina; 550 sq.m.; pop. '80, 14,283—1291 colored. The surface is uneven and hilly, and the soil generally fertile in the valleys. Portions are heavily wooded. Wheat, oats, pork, and Indian corn are the chief products. It is on the East Tennesee, Virginia and Georgia railroad. Co. seat, Madisonville.

MONROE, a co. in s.e. West Virginia, having for its s. and s.e. boundary a ridge of the Alleghany mountains, the Kanawha river crossing its extreme n. section and a portion of its s.w.; 500 sq.m.; pop. '80, 11,501—11,446 of American birth, 1181 colored. It is intersected by the Chesapeake and Ohio railroad. Its surface, generally mountainous, is drained by the Greenbrier river, and the New river forming part of its w. boundary. It is largely covered with forests of hardwood diversified by groves of sugar-maple. Its soil is very fertile, producing grain, tobacco, wool, and the products of the dairy, and is highly esteemed for its good pasturage and facilities for stock-raising. Red sulphur and white sulphur springs are found in the s. section. Co. seat, Union.

MONROE, a co. in s.w. Wisconsin; 900 sq.m.; pop, 21,606. The surface is rolling and irregular. The soil is fertile, producing, in large quantities, corn, wheat, oats, potatoes, and hay. Large amounts of wool and butter are made. Many tons of hops are annually gathered. There are a number of saw and flour mills, and many miscellaneous manufactories, as cooper, machine, and carriage shops, and paper and clothing mills. The La Crosse, Kickapoo, Lemonweir, and other rivers pass through it. It is on the line of the Chicago, Milwaukee and St. Paul, and of the West Wisconsin railroads. Co. seat, Sparta.

MONROE, a city of Michigan, United States, is situated on the river Raisin, 2 m. from Lake Erie, and 32 m. s.w. of Detroit. It is the eastern terminus of the Michigan Southern railway. It has a large court-house, 7 churches, woolen manufactories, flour-mills, etc. Pop. '74, 5,782. Monroe was settled by the French in 1776.

MONROE (*ante*). This pleasant old French town in Michigan, though left behind by the cities of Toledo, south, and Detroit, north, remains the seat of a young ladies' seminary, of several prosperous manufacturing industries. and extensive nurseries, and makes moderate shipments of produce, sand for glass-making, etc. It was settled under the name of Frenchtown, by French from Detroit, in 1784. The battle of the river Raisin, between the English and their Indian allies and an American force, occurred near Monroe in 1813, resulting in the massacre of several hundred American prisoners.

MONROE, James, fifth president of the United States, was b. in Westmoreland co., Virginia, April 28, 1758. He was descended from a captain Monroe of the army of Charles I., who emigrated, with other cavaliers, to Virginia. James Monroe entered the revolutionary army at the age of 18, as a cadet, and was present at several battles; but having lost his rank in the army by serving as aid-de-camp, he commenced to study law with Jefferson. In 1782 he was elected to the assembly of Virginia, and at the age of 23 to the executive council. Next year he was elected to congress, where he took an active part in the movements for framing a new constitution. He joined with Patrick Henry and other leading states' rights men in opposing the ratification. He feared the power and encroachment of the federal government. He was afterwards sent by Washington as minister to France, and was received with singular enthusiasm by the revolutionary government. He was, however, soon recalled, for having too decided French sympathies. In 1799 he was elected governor of Virginia; and in 1803 sent by Jefferson as minister to France, to purchase Louisiana, which vast territory he secured for 15,000,000 dollars. He was now employed for several years in diplomacy in England and Spain. On the election of Mr. Madison to the presidency, he was made secretary of state, and also performed the duties of secretary of war. In 1816 his eminent services were rewarded by his being elected president of the United States by the democratic-republican party, and he made himself very popular. The acquisition of Florida from Spain, and the settlement of the vexed question respecting the extension of slavery by the Missouri compromise, by which, after the reception of Missouri as a slave state, the institution was prohibited above the line of latitude 36° 30', helped to secure his re-election in 1820. His most popular acts, perhaps, were the recognition of the independence of Mexico and the South American republics, and the promulgation of what has since been called the "Monroe doctrine," in which he declared the American policy of "neither entangling ourselves in the broils of Europe, nor suffering the powers of the old world to interfere with the affairs of the new," and that "any attempt to extend their system to any portion of this hemisphere would be dangerous to our peace and safety." In 1825 he retired to his seat at Oak Hill, Loudon co., Virginia; but he still continued in the public service. After being twice president, he acted as justice of the peace, a visitor of the university of Virginia, and member of a state convention; but a profuse generosity and hospitality caused him to be overwhelmed with debt, and he found refuge with his relations in New York, where he died in 1831—like his predecessors, Adams and Jefferson, on July 4. He was an honorable and able statesman, though not a speaker or a man of brilliant talents.

MONROE DOCTRINE, a scheme of public policy, named after its author, James Monroe, fifth president of the United States of America, by whom it was enunciated in his message to congress, Dec. 2, 1823. Mr. Monroe set forth in his message that "as a principle, the American continents, by the free and independent position which they have assumed and maintained, are henceforth not to be considered as subjects for future colonization by any European power;" and that any attempt on the part of the European powers to "extend their system to any portion of this hemisphere" would be regarded by the United States as "dangerous to our peace and safety," and would be opposed accordingly.

MONS (Flem. *Berghen*), an important t. of Belgium (formerly fortified), capital of the province of Hainault, on the Trouille, 35 m. s.w. of Brussels. Its fortifications were renewed and strengthened since 1818, but in 1866, in accordance with the new arrangement for the defense of the country, they were demolished. The immediate vicinity can be laid under water by altering the course of the Trouille. The *canal de Condé* connects the town with the Scheldt, and there is communication by railway with Brussels, Valenciennes, Charleroi, etc. Its principal architectural ornament is the cathedral of St. Waudru, dating from the 15th and 16th centuries—a masterpiece of Gothic. The chief manufactures are woolen and cotton goods, cutlery, small-wares, and sugar refining. The vicinity forms an extensive coal-field, with about 400 pits. A large trade is carried on in coals, flax, hemp, horses, and cattle. Pop. '75, 24,539.

Mons, supposed to occupy the site of a Roman station, was made the capital of Hainault by Charlemagne in 804. During the 17th and 18th centuries, it was frequently the object of contest between France and Austria.

MONSEIGNEUR, a French title, compounded of the words *mon* and *seigneur*, meaning my lord, applicable to royal or imperial princes, cardinals, archbishops and bishops of France, and accorded in courtesy to the high officers of government, and persons generally of high rank. Its plural is *messeigneurs*. Abbreviations *mgr.*, *mgrs.* The title was not applied to bishops until about the close of the 17th c., when they acquired it by concerted action in addressing each other in that way. Their title previously was simply *monsieur*. A law of the French convention in 1801 interdicted the use of the title to bishops and archbishops, and required them to confine their signature titles, and their addresses to each other to the words *citoyen* or *monsieur*. In the language of French thieves *monseigneur* is applied to a tool used to break locks.

MONSELI'CE, a walled t. of North Italy, 13 m. s.e. of Padua, on the canal of Monselice, which extends from Padua to Este. Monselice was a place of importance in the middle ages. It has several silk-mills. Pop. 3,160.

MONSIEUR, plural *messieurs*, a French title formerly addressed to persons of medium rank, and corresponding to sir or my sir in English; now universally employed in French by all gentlemen in addressing each other. It is also used as a prefix to titles of rank, as *monsieur le prince*, *messieurs les députés*, *monsieur le préfet;* and as a form of respect in mentioning a third person without regard to rank, as *monsieur votre frère*, *monsieur votre voisin*, etc. In the middle ages the title was given to saints, as *monsieur saint Pierre*, *monsieur saint Jean*, etc., and also in the same manner applied as a prefix to the names of popes and of members of the royal family when alluded to in the third person. It was the special title of the oldest brother of the French king, the duke of Orleans, who was specifically indicated when one spoke simply of *monsieur*. The title is dropped before the names of persons of great fame, as belittling when speaking of them, as Lamartine, Carnot, etc.

MONSON, a t. in Hampden co., Mass., 15 m. e. of Springfield; pop. '80, 3,578. It contains manufactories of hats and bonnets, and woolen goods, a national bank, 3 churches, an academy, and a state school for the children of alien paupers. The Boston and Albany, and New London Northern railroads pass through it. The Monson academy has long had a high repute, attracting students in preparation for college from distant places; and noted for its moral and religious influence. Many men of eminence have gained here the foundation of their education. It is one of the schools chosen for the education of the youth sent to this country for study, and supported here, by the Chinese government.

MONSOON (Malayan, *musim*) is derived from the Arabic word *mausim*, a set time or season of the year, and is applied to those winds prevailing in the Indian ocean which blow from the s.w. from April to October, and from the opposite direction, or n.e., from October to April. The existence of these winds was made known to the Greeks during the Indian expeditions of Alexander, and by this knowledge, Hippalus was emboldened to sail across the open sea to Muzeris, the emporium of Malabar. The monsoons depend, in common with all winds, whether regular or irregular, on the inequality of heat at different places and the earth's rotation on its axis; but more particularly they are occasioned by the same circumstances which produce the trade-winds and the land and sea breezes, being, in fact, the combined effect of these two sets of causes.

If the equatorial regions of the earth were entirely covered with water, the trade-winds (see TRADE-WINDS) would blow constantly from the n.e. in the n., and from the s.e. in the s. of the torrid zone, with a belt of variable winds and calms interposed; the whole system, following the sun's course, moving northward from December to June, and southward from June to December. But, especially in the eastern hemisphere, large tracts of land stretch into the tropics, and give rise to the extensive atmospheric disturbances for which those parts of the earth are so remarkable. During the summer half of the year, the n. of Africa and the s. of Asia are heated to a higher degree than the Indian ocean, while Australia and South Africa are much colder. As the heated air of southern Asia expands and rises, and the colder air from the s. flows in to supply its place, a general movement of the atmosphere of the Indian ocean sets in towards the n., thus giving a *southerly* direction to the wind; but as the air comes from those parts of the globe which revolve quicker to those which revolve more slowly, an easterly direction will be communicated to the wind; and the combination of these two directions results in the s.w. monsoon, which prevails there in summer. Since, during winter, South Asia is colder than the Indian ocean, which, again, in its turn, is colder than South Africa, a general motion of the atmosphere sets in towards the s. and west. As this is in the same direction as the ordinary trade-wind, the effect in winter is not to change the direction, but only to increase the velocity of the trade-wind. Thus, while s. of the equator, owing to the absence of sufficiently large tracts of land, the s.e. trade-winds prevail throughout the year; on the n. of the equator we find the s.w. monsoon in summer, and the n.e. in winter; it being only in summer and n. of the equator that great changes are effected in the direction of the trade-wind.

Similar though less strongly-marked monsoons prevail off the coasts of Upper Guinea in Africa, and Mexico in America. The e. and w. direction of the shores of these countries, or the large heated surfaces to the n. of the seas which wash their coasts, produce, precisely as in the case of South Asia, a s.w. monsoon in summer. As might have been expected, the monsoon off the coast of Mozambique is easterly, and that off the coast of West Australia north-westerly. The trade-winds also suffer considerable change in their direction on the coasts of Brazil, Peru, Lower Guinea, etc These, though sometimes considered monsoons, are not truly such, for they do not change their directions periodically, so as to be opposite to each other, like true monsoons, but only veer through a few points of the compass. For a fuller account of these partial deflections, see TRADE-WINDS.

In April, the n.e. monsoon changes into the s.w.; and in October, the s.w. into the n.e. These times depending on the course of the sun, and consequently varying with the latitude, are called the breaking up of the monsoons, and are generally accompanied by variable winds, by intervals of calm, and by furious tempests and hurricanes.

Monsoons, when compared with the trade-winds, will be found to play a most beneficial and important part in the economy of the globe. Their greater velocity, and the periodical changes which take place in their direction, secure increased facility of commercial intercourse between different countries. But the full benefits following in their train are not seen unless they be considered in their relation to the rain-fall of southern Asia. Indeed, the fertility of the greater part of this fine region is entirely due to the monsoons; for if the n.e. trade-wind had prevailed there throughout the year, central and western India, and many other places, would only have been scorched and barren saharas. The rain-fall of India depends entirely on the monsoons. The coast of Malabar has its rainy season during the s.w. monsoon, which brings thither the vapors of the ocean. On the Coromandel coast, on the other hand, it is the n.e. monsoon which brings the rain from the bay of Bengal. The two coasts of Hindustan have therefore their seasons reversed, the dry season of the one corresponding with the wet season of the other.

MONSTER. See MONSTROSITY, in anatomy.

MONSTRANCE (Lat. *monstrare*, to show), called also OSTENSORY, the sacred utensil employed in the Roman Catholic church for the purpose of presenting the consecrated host for the adoration of the people, as well while it is carried in procession, as when it is exposed upon the altar on occasions of special solemnity and prayer. The use of the monstrance probably dates from the establishment of the festival of Corpus Christi in the 13th century. It consists of two parts, the foot or stand upon which it rests, and the repository or case in which the host is exhibited. The latter contains a small semicircular holder called the *lunula*, or crescent, in which the host is fixed; and it appears anciently to have been of a cylindrical or tower-shaped form, in the central portion of which, consisting of a glass or crystal cylinder, the host was placed. At present it is more commonly in the form of a star or sun with rays, the central portion of which is of glass or crystal, and serves to permit the host to be seen. This portion, or at least the crescent, is of gold or of silver gilt; the rest is generally either of the precious metals, or at least gilt or silvered, although the lower portion is occasionally of bronze artistically wrought. In many cases it is of most costly materials and workmanship. The monstrance, like the other vessels used in the Eucharistic service, is consecrated by a bishop, or a priest deligated by a bishop. By a peculiar usage of the city of Lucerne, in Switzerland, the Eucharist is always carried in the monstrance, when being borne to the sick.

MONSTRELET, ENGUERRAND DE, 1390–1453; a chronicler following immediately after Froissart, and with less charm of narration; the first clear, reasoning, and exact collector of the facts of the history of his time. In 1430 he had a civil and military function in Compeigne, and was afterwards present at the interview between Jean d'Arc and the duke of Burgogne. His chronicles of the 15th c. were republished in 7 vols., Paris, 1857.

MONSTROSITY, in anatomy. When an infant, or the young of any animal, comes into the world impressed with morbid changes, which occur only in fetal life, and of which it has never been observed that they have originated in the same way after birth, such an infant or young animal is said to be a monster or monstrosity. Monsters were formerly regarded as prodigies of nature; and in the dark ages their occurrence in the human species was usually ascribed to the intercourse of demons and witches. It is now perfectly understood that the formation of those apparently anomalous beings may be accounted for by the same laws as those which govern the formation of perfect individuals—the only difference being that these laws in the case of monstrosity are more or less arrested or otherwise perverted.

Amongst the principal causes of monstrosity may be mentioned: 1. Something deficient or abnormal in the generative matter of one or both parents, because, as has been shown in the article HEREDITARINESS, malformations are frequently transmitted from parents to the children. Here the morbid change is impressed upon the fetus at the moment of impregnation. 2. Some morbid condition of the maternal organs or constitution may exercise a disturbing influence on development. 3. Diseases and abnormal states of the placenta, of the membranes of the ovum, and of the umbilical cord, may induce an arrest of development; for example, it may be easily understood how abnormal shortness of the cord may favor the origin of fissure of the abdomen; while a cord of disproportional length may coil round one of the extremities, and by constriction may dwarf it, or even amputate it. 4. Morbid influences acting directly on the fetus, as mechanical injuries and diseases affecting it, are the most frequent causes of malformations. From the experiments of several observers, it has been shown that by submitting hens' eggs to various mechanical influences during incubation, the development of the embryo may be interrupted, or modified in such a manner as to give rise to malformations; and many observations tend to prove that mechanical influences affecting the womb (kicks, blows, or falls) in the early months of pregnancy, produce certain malformations, by causing an arrest of development. Moreover, the fact that certain malformations usually occur only in twin or triplet pregnancies, favors the view that certain monstrosities are due to pressure and confined space.

Of the various classifications of monstrosities, the following is perhaps the best: 1. Malformations in which certain parts of the normal body are entirely absent, or are too small. 2. Malformations produced by fusion or coalescence of organs. 3. Malformations in which parts naturally united, as in the mesial line of the body, are separated, and clefts or fissures occur. 4. Malformations in which natural openings are closed. 5. Malformations of excess, or in which certain parts have attained a disproportional size. 6. Malformations in which one or more parts have an abnormal position. 7. Malformations of the generative organs.

The *first class* includes (1) completely shapeless malformations, in which the monster presents the appearance of a lump or mass, with no indication of definite organs; (2) malformations which consist of only a more or less rudimentary trunk, with no head or extremities; (3) trunkless monsters, in which the inferior parts of the body are wanting, and little more than a rudimentary head is present, which, instead of neck and trunk, is furnished with a pouch-like appendage, containing rudimentary viscera and pieces of bone; (4) malformations in which the head, and sometimes a part of the upper part of the body, are wanting, constituting acephalic monsters, which are by no means rare, the number of recorded cases in the human subject being over 100; (5) malformations in which the whole head is not absent, but some of its component parts are wanting—as, for example, the brain, some of the cranial bones, the nose, or the eyes; (6) cases in which the extremities are absent or imperfect to a greater or less degree—for example, they may be mere stumps, with the fingers and toes either absent or rudimentary, or the hands and feet may appear to exist independently of arms and legs, and to be inserted immediately into the trunk; (7) cases in which all the organs may be present, but some of them may be too small—thus, there may be general dwarfishness, or the head or limbs may be abnormally small. None of the monsters of this class, except those included in the last two groups, are viable.

In the *second class* are included such cases as (1) the various forms of *cyclopia*, or coalescence of the eyes; these malformations are not very rare in the human subject, and are of frequent occurrence in pigs and other animals; although usually born alive, these monsters are not viable; (2) coalescence of the lower extremities either into a common limb, which supports two feet, or into an undefined tail-like mass; (3) minor amalgamations, which do not affect vitality, as more or less perfect coalescence of the fingers and toes.

The *third class* embraces such cases as (1) fissures of the cranium, which are generally due to hydrocephalus in the fetus; (2) harelip and cleft palet; (3) fissures on the neck, whose origin is due to the respiratory clefts—which, during the formation of the embryo, appear in the cervical region, not uniting at an early stage, as in the normal condition, but remaining more or less open; (4) fissures of the vertebral arches of the spinal column, occasioning the affection known as *spina bifida;* (5) fissures of the thorax, in which case the lungs or heart are more or less exposed; (6) fissures of the abdomen.

The malformations of the *fourth class* include congenital closure of the anus, the mouth, the nostrils, etc.

The malformations of the *fifth class* may be arranged in two divisions, according as certain parts are too large, or there are supernumerary organs.

The *sixth class* is very extensive, and embraces many varieties. One or more parts may be disproportionately large—as, for example, the head in cases of congenital hydrocephalus; or there may be one or several supernumerary organs—a sub-class which presents a very great range, from the simplest cases, in which a single joint of a finger is supernumerary, to those of a highly complicated nature, when two or even three bodies are united by some one point. There may be a single head and trunk and supernumerary parts—as, for example, supernumerary teeth, vertebræ (giving rise to the formation of a tail in the human subject), ribs, mammæ, fingers, toes, etc.; or there may be malformations with more than one head and trunk—double, or even triplet monsters. This sub-class is divisible into two groups, according as the united individuals are equally developed, or as only one is developed; the second being more or less atrophied, and forming a parasitic appendage to the first. As examples of the first group, we mention (1) duplication of the head and upper part of the vertebral column; (2) duplication of the head, neck, and upper extremities, while the chest and abdomen are single, or fused into one another (in this group, we must place the twin-monster Rita Christina, who was born in Sardinia in Mar., 1829, and was brought alive to Paris, where she died in the November of that year); (3) almost complete duplication, with separation of the two bodies, except at a single spot, as in the case of the Siamese twins; (4) triplet monsters, such as the child with three heads born in 1832 in Catania (see Geoffroy St. Hilaire, *Histoire des Anomalies de l'Organisation,* vol. iii. p. 327). To the second group belong such cases as the following: (1) a perfect individual may bear on its head another head, with traces of the rest of the body; (2) on a well-developed body, a second, smaller and defective one, may be situated, which, after birth, does not increase in size; (3) in a more or less perfectly developed individual, there may be concealed, commonly in the abdomen, parts of a second individual—a condition which has received the name of *fœtus in fœtu,* and which is most probably caused by the inclusion of one germ by another.

To the *sixth class* belong (1) those cases in which there is a reversing of the position of the internal organs—when the heart and spleen lie upon the right, and the liver and cæcum on the left side; (2) anomalies in the course and distribution of individual vessels.

The malformations constituting the *seventh class* have been sufficiently noticed in the article HERMAPHRODITISM.

The term *teratology* (from the Greek words *tĕras,* a prodigy, and *lŏgos,* a discourse) is now frequently applied to the history and science of monstrosities. For further information on this subject, the reader is referred to Geoffroy St. Hilaire, *Histoire des Anomalies de l'Organisation* (3 vols. 1832–36); Otto, *Monstrorum Sexcentorum Descriptio Anatomica* (1841); and to the article "Teratology," by Vrolik, in *The Cyclopædia of Anatomy and Physiology.*

MONSTROSITY, in botany, is a malformation or abnormal development of any part of a plant. It may take place, however, at any period of the growth of a plant, as to any new organ that is developed, and sometimes merely affects a particular organ or some portion of a plant, as a particular leaf, flower, petal, sepal, etc., or the leaves or flowers of a particular branch, while in other cases all the organs of the same kind exhibit the same abnormal character. As in animals, it is now well known that monstrosities in plants are the result of special conditions affecting the operation of ordinary natural laws: and the study of monstrosities is very important in relation to that of the nature, development, and metamorphosis of organs. In the article METAMORPHOSIS OF ORGANS, some of the most frequent monstrosities are alluded to. Monstrosities in plants are not always, as in animals, reckoned deformities *Double flowers* afford a familiar example of an opposite kind; although with regard to the plant itself they have the effect of unfitting it for one of the functions of a perfect plant, reproduction by seed.

MONTAGNA'NA, a t. of northern Italy, in the province of Padua, situated pleasantly on the banks of a canal, Il Fiumicello, 32 m. s.w. of Padua. It is still protected by walls and towers, and has a fine cathedral and palace. Pop. 7,657. Its chief trade is in spun-silk, wool, hemp, and coarse cotton textures.

MONTAGNARDS, or simply MONTAGNE, "the Mountain," the name given to the extreme democratic politicians in the first French revolution, because they seated themselves on the higher benches of the hall in which the *national convention* met. Their principal members were Danton, Marat, Robespierre, St. Just, and Collot d'Herbois, the men who introduced the "reign of terror." The opposite party of the "plain" (*plaine*) were the Girondists (q.v.), who sat on the lowest benches on the floor of the house. After the overthrow of the Girondists, this part of the house was styled the "marsh or swamp" (*marais*), and included all the subservient members whose votes were under the control of "the Mountain." A few leading men gave all its strength and formidable character to the party o fthe Mountain. After 1848, the extreme party in the *national assembly*, composed of revolutionary democrats and communists, sometimes flattered itself with the designation of "the Mountain;" but events proved that it possessed nothing of the genius, though it showed all the malignity of its terrible predecessor.

MONTAGU, Family of. This noble family are said, by Burke, to derive their name, which in Latin was and is always written De Monte Acuto, from a place in Normandy; and the first of the Montagus who settled in England was a warrior who came over in the train of Robert earl of Moreton at the conquest. Five centuries later, we find his descendant, sir Edward Montagu, lord chief-justice, in succession, of the courts of king's bench and common pleas under Henry VIII., who also appointed him one of the executors of his will and guardians of his son Edward. His grandson, who was a distinguished orator, represented the city of London in Parliament; and having been lord chief-justice of the court of king's bench, and lord treasurer of the kingdom, was raised to the peerage as earl of Manchester. The second earl gained distinction as a general in the parliamentary army, and more particularly by his victory over Prince Rupert at Marston Moor; but he scrupled to take part in the condemnation and execution of Charles, and was one of the first members of the house of peers who gave in his adhesion to Charles II. on his restoration. This nobleman's grandson enthusiastically espoused the cause of William III., under whom he fought at the battle of the Boyne, and took part in the siege of Limerick. He was subsequently sent as ambassador to Venice and to the courts of France and Vienna, and eventually was raised to the dukedom of Manchester by George I. The title is still enjoyed by his descendant, the 7th duke. Other branches of the Montagu family were ennobled in the persons of the earl of Sandwich, the earl of Halifax, and the duke of Montagu, but the last two titles both became extinct before the close of the 18th century.

MONTAGU, Basil, 1770–1851; b. London. He was the son of John Montagu, fourth earl of Sandwich, and of Miss Ray, who was shot in 1779 in the piazza of Covent garden by the rev. James Hackman in a fit of jealous frenzy. He received his early education at the Charter House school in London, and took the degree of M.A. at Cambridge in 1790, distinguishing himself by his love of literature; entered Gray's Inn, and was admitted to the bar in 1798. While in London he became intimate with Coleridge, and adopting the opinions of Godwin, determined to abandon the law, but was dissuaded by sir James Mackintosh. He was a copious and able writer. The most important of his works is a *Digest of the Bankrupt Laws*, in 4 vols., for which he obtained in 1806 the office of commissioner of bankruptcy. This became a standard work and passed through many editions. Hs was distinguished for his efforts to mitigate the severity of the penal code. He wrote several pamphlets on capital punishment, and with Wilberforce, Romilly, and others succeeded in obtaining the abolition of hanging for forgery. He edited Bacon's works in 16 vols. He published 40 vols., and left 100 more in manuscript.

MONTAGU, Edward Wortley, 1718–76; b. Wharncliffe, Yorkshire, Eng., only son of Edward Wortley and lady Mary. When very young he ran away from Westminster school repeatedly, gave himself up to the lowest vices, and hired himself out as a cabin boy in a ship sailing for Spain, where he was discovered by the British consul at Cadiz, and restored to his family. He was then committed to the charge of a private tutor who obtained for him an appointment to a public office. He was then sent to travel on the continent under the care of the tutor, and while abroad he published his first work, *Reflections on the Rise and Fall of Ancient Republics*. While at Paris he became involved in an altercation with a Jew which led to a criminal prosecution. On his return to England he married, while still under age, a woman much older than himself, and in a few weeks deserted her. Notwithstanding his profligacy he obtained a seat in parliament in 1847, and was re-elected, until being involved in debt by his extravagance he was forced to resign. He again went abroad, never returning to England. He proceeded first to Italy, became a convert to popery, and then went to Egypt where he turned Mohammedan. He spent the remainder of his life in the Levant, having been in the mean time disinherited by his parents, but was on his way back to England when he died at Padua. Besides the tract before mentioned he wrote another, entitled *An Examination into the Cause of Earthquakes*, and contributed some papers to the *Philosophical Transactions*. His tract on *Ancient Republics* was claimed as the production of Mr. Foster, his tutor.

MONTAGU, Elizabeth Robinson, 1720–1800; b. York, Eng.; was married in 1742 to Edward Montagu, grandson of the first earl of Sandwich, who on his death left her a large fortune. With abundance of wealth, and possessing literary talent, she became a leader in London society, and her residence was the favorite resort of literary persons. For several years she gave annual dinners on May-day to the chimney-sweeps of London. She wrote three *Dialogues of the Dead*, published in lord Lyttleton's work by that name, and an *Essay on the Writings and Genius of Shakespeare, compared with the Greek and French Dramatic Poets*. She is well known by her correspondence in 4 vols.

MONTAGU, LADY MARY WORTLEY, was eldest daughter of Evelyn, earl, and afterwards (1715) duke of Kingston. She was born about 1690, and is said to have received a classical education. When only eight years of age she was introduced by her father to the famous *Kit-Cat club*, and formally admitted a member. Her fond pleasure-loving father allowed her to educate herself. She is even said to have taught herself Latin. She became attached to Mr. E. Wortley Montagu, a member of the house of commons, whose cousin, Charles Montagu, was created earl of Halifax, and appointed first lord of the treasury, by George I. As the match was disapproved of by the families, she was obliged to elope before she could marry him. On the accession of George I. she came to London with her husband, who was a whig. Lady Mary's beauty and wit attracted universal admiration at court. She was in habits of familiar acquaintance with Addison and Pope, the latter becoming her enthusiastic admirer, and writing "flames and raptures" for her, until his passion "came to a climax in an impertinence, and was extinguished by a box on the ear, or some such rebuff." In 1716 Mr. Wortley Montagu was appointed ambassador to Constantinople. He was accompanied by lady Mary, who, on her journey, and during her residence in the Levant, wrote the well-known *Letters*, which form one of the most delightful books in our language. The weaknesses of a somewhat vain and capricious temper fade into forgetfulness, when we remember the strong sense, enlightened courage, and generous perseverance which introduced into Europe the practice of inoculation, which she witnessed in Turkey. She had so much faith in its safety, that she tried it first on her own son. See INOCULATION. After her return to England she fixed her residence at Twickenham, and renewed her intimacy with Pope. But political soon led to personal differences, and these resulted in one of the most famous literary feuds of the 18th century. The immediate occasion of it was the publication by lady Mary of her *Town Eclogues*. She was fiercely assailed by both Swift and Pope, and was not slow to retaliate. In 1737 she left her country and her husband (for reasons that are not known), and lived for many years in Italy, chiefly at Lovero, in the province of Venice. Her husband died in 1761. At the request of her daughter, afterwards wife of the earl of Bute, she returned to England, where she died 21 Aug., 1762. A collected edition of her works, with life, was published by her great-grandson, the late lord Wharncliffe, in 1836, of which a third edition appeared in 1861.

MONTAGUE, a co. in n. Texas, bounded on the n. by the Red river, which separates it from the Indian territory, and drained by the Denton fork of Trinity river, and by Clear creek; 850 sq.m.; pop. '80, 11,257—11,162 of American birth. The soil in the vicinity of Red river is good. Cattle raising is the chief business. Co. seat, Montague.

MONTAGUE, CHARLES. See HALIFAX, EARL OF, *ante*.

MONTAJONE, a t. in n. Italy, near the sea, about 25 m. s.w of Florence, having mineral springs celebrated for their medicinal properties; pop. 10,553. It is in a province of the same name.

MONTAIGNE, MICHEL EYQUEM DE, a distinguished French moral philosopher, was b. in 1533, at his paternal home of Montaigne, in Perigord. In accordance with his father's eccentric ideas on education, he was taught, and suffered only to speak Latin from his earliest infancy, in consequence of which he acquired such a perfect mastery over the language, that when, in his tenth year, he entered the college of Bordeaux, his masters, Grouchi, Buchanan, and Muret, were almost afraid to address him. On the expiration of his course of studies, which were directed to law, he received, in 1554, the appointment of councilor in the parliament of Bordeaux; but being possessed of ample means, and having no inclination for a public life, he devoted himself to the study of the various schools of Greek and Roman philosophy; and on the death of his father, in compliance with whose wish he had made a translation of the natural theology of Raymundus Sebondus (Paris, 1569), he retired to his ancestral estate, where he lived in retirement during the terrible season of religious oppression which desolated France for so many years. During this period, 1580, he composed the first two books of his celebrated *Essais*, the third portion of which appeared in 1588, after his return from an extensive course of travels, which he had undertaken partly to escape from the plague, and partly for the improvement of his own health, and during which he visited Rome, and was received with signal favor by the pope. Montaigne's *Essais*, although not conceived in the spirit of a believing Christian, or marked by the reticence and delicacy of expression which modern refinement demands, are very extraordinary productions, not only for the learning and sound reasoning which they manifest, but also for the frank and liberal tone in which social questions are discussed, notwithstanding that the author wrote at a period when religious differences and party feelings blinded the judgments of men. Montaigne's ethics were those of Seneca and the other philosophers of ancient times, whose works he had so thoroughly mastered; and, judged from our point of view, his morality is that of a virtuous pagan merely; but when we bear in mind the turmoil of civil war, and the consequent disorganization of society, together with the low ebb of literature in France at that period, we must do justice to the great merit of the writer, and the influences for good which his writings exerted. Montaigne was a constant, and occasionally a successful mediator between the party of Henry of Navarre and that of the Guises, and stood in relations of friendship with men of all creeds. He died in 1592 as an avowed member of the Church of Rome, in whose doctrines he professed implicit faith, notwithstanding the sceptical bias which he had through life been at no pains to conceal. Numerous editions have appeared of his *Essais*, among which we may instance those of De Coste (5 vols. Hag. 1727), and Victor Leclerc (Paris, 1826). Nearly 200 years after his death, the discovery was made at Montaigne of the MS. of his travels, which was was published at Paris in 1774 under the title of *Journal de Voyage de M. de M. en Italie par la Suisse et l'Allemagne.* Translations of the *Essais* exist in almost all the European languages; the best English translation is that by Cotton. The best biographies of Montaigne are by Grün (Paris, 1855); Payen (Paris, 1856); and Bayle St. John (Lond. 1857).

MONTALCI'NO, a t. in the province of Siena, Central Italy, 22 m. s.s.e. of the town of Siena, stands on a hill in the midst of valleys, and enjoys a fine equable climate. Pop. 7,540. The wine of Montalcino is in high repute throughout Tuscany.

MONTALEMBERT, CHARLES FORBES, Comte de, was b. in April 1810 of an ancient family of Poitou. His father was created a peer of France under the Restoration, and for a considerable time was minister of the French court in Sweden. His mother was of the Scottish family of Forbes, to which circumstance may be ascribed Montalembert's remarkable familiarity with the English language, and his intimate knowledge and strong admiration of the social and political institutions of England. Although his more advanced studies were carried on in the university of Paris, a considerable part of his youth was spent in Sweden; and the first work by which he was brought into notice, was a pamphlet on Sweden, which he published in his nineteenth year. On the death of his father, Montalembert succeeded to his honors, and to his seat in the Chamber of Peers. But his earliest public appearance was in what may be truly considered as the great labor of his life, a joint effort in which he associated himself with the Abbé Lacordaire (q.v.) and other friends, for the purpose of taking advantage of the recent charter, by establishing a free school for Catholic education, independent, as well of the university, as of all other state influence. An attempt on the part of the police to interfere arbitrarily with this project, became the subject of a trial before the Chamber of Peers, which Montalembert rendered memorable by his first speech, one of the most brilliant upon record, and a clear foreshadowing, not alone of the eloquence, but of the bold and uncompromising earnestness in the cause of his church and of the common interests of religious liberty, which have constantly characterized his later career. Of the struggle of the Catholic party in France against what they regarded as the arbitrary monopoly of education which was claimed for the university, Montalembert was for many years the leader and champion; and in the various works in the preparation of which he employed all his leisure from public duties, his *Life of St. Elizabeth of Hungary*, his *Life and Times of St. Anselm*, and, above all, in an appeal *On the Duty of Catholics on the Question of Freedom of Education*, which he wrote during a visit to the island of Madeira for the recovery of his health in 1843, he never ceased to advocate the same principles. After the revolution of 1848, Montalembert, true to his former professions, was one of the first of his party to accept of the new state of things, and to use the actual means at his disposal for the furtherance of the views which he had consistently advocated. He was elected member of the national, and afterwards of the legislative assembly; and for a time contrived, while he continued the same line of policy as regards church interests, to give a general support to the government of Louis Napoleon as president of the republic. His first break with that government was on the question of the proposed confiscation of the Orleans property; and after the *coup d' état* of December, the breach became irreconcilable. From that time, Montalembert continued to be the implacable assailant of the arbitrary repression of public opinion which characterized some measures of Napoleon III.; and the brilliant and enthusiastically admiring pictures, which in his *Political Future of England*, he has drawn of its social and political institutions, derive much of their vigor from the covert but palpable contrast with the condition of France which points them all. Besides numerous articles contributed by him to the *Revue des Deux Mondes*, the *Encyclopédie Catholique*, and the *Correspondent*, he also wrote: *L'Avenir politique de l'Angleterre* (1855); *Les Moines d'Occident depuis St. Benoît jusqu' à St. Bernard* (1860—67); English translation, 5 vols. 1861—67); *Une Nation in deuil, la Pologne en* 1861; *L'Eglise libre dans l'Etat libre* (1863); *Le Pape et la Pologne* (1864), etc. He died Mar. 13, 1870. See Memoir by Mrs. Oliphant, 2 vols. (1872).

MONTALEMBERT, MARC RENÉ, Marquis de, 1714-1800; b. and educated in Angoulême; entered the army at the age of 18, and while engaged in military service made a specialty of scientific study, and in 1747 became a member of the academy of sciences of Paris. In 1751 he constructed foundries at Rouelle for cannon of larger caliber than previously used, which were employed in the seven years' war (1756-63), in which he was general in the service of Sweden and Russia. He aided Todleben in the capture of Berlin in 1760, and the following year had finished a great work on fortifications, which he was about to publish, when the French minister, Choiseul, interdicted the publication in order to have it for the sole benefit of France. He became the chief military engineer of France, and his systems proved superior to all others. In 1779 he constructed a fort of wood on the *Isle d'Aix*, which was found to have wonderful resistance in proportion to its cost. At the beginning of the French revolution Mirabeau undertook to make him inspector-general of the fortifications of France, but his rank was a bar-sinister. In 1792 the French war office, under Carnot, purchased his collection of models, and he became the trusted adviser of that minister. He lived to see his inventions and theories, following in general the system of Vauban, adopted in France and throughout Europe, after many years of almost contemptuous opposition. His main work is *Fortification perpendiculaire*, 11 quarto vols., 1776–78; re-edited and published in 1793 under the title of *L'Art défensif superior a l'art à l'offensif.* He was author also of many memoirs on various subjects, of poems, and of comedies.

MONTALVAN, JUAN PEREZ DE, 1602–38, b. Madrid. He received instruction and assistance from the famous dramatic writer Lope de Vega, to whom he became greatly attached, and whom he adopted as his model in almost everything. Like his master, he entered the priesthood, and accepted an office in the inquisition. At the age of 30 he had written 36 dramas, and in 1636 the number had increased to 60. The construction was flimsy and the execution careless. One of his last works was an extravagant panegyric, in 1636, on his friend and instructor. His intense and incessant study had now begun to affect his brain, and he soon fell into a state of imbecility, which continued till his death. His collected dramatic works appeared in 1638–39, and were reprinted in 1652.

MONTA'NA, a territory of the United States, formed in 1864, extending from lat. 45° to 49° n., and long. 104° to 116° west. It is mostly to the east of the Rocky mountains, and is bounded, n. by British America, w. by Washington and Idaho, s. by Wyoming, e. by Dakota. Its average length is 470 m., its average breadth 275 m., and its area 143,776 sq.m., or 92,016,640 acres, of which, in 1870, 84,674 were under cultivation. Montana has great mineral wealth, not yet fully taken advantage of, including gold, silver, galena, copper, coal, and precious stones. Its yield of bullion in 1866 was valued at $16,500,000; in 1874, $4,000,000. It is exceedingly well watered, the chief rivers being the Missouri and Yellowstone, with their affluents, and the Columbia. Montana is well adapted for grazing. Pop. '70, 20,595, besides 22,486 tribal Indians.

MONTANA (*ante*), a territory of the United States formed from parts of Idaho and Dakota; pop. '80, 39,157—27,642 of American birth, 3,689 colored, 1787 Chinese, and 1750 Indians and half-breeds. Its surface is rough and mountainous, the main range of the Rocky mountains entering the w. portion from the n., and extending 200 m. s.e. in that section; thence changing their direction and trending toward the w. boundary, where they join the Bitter Root mountains. In the e. portion are the Little Rockies, Little Bear, Bear's Paw, Kay-i-you, Gallatin, the Belt range s. of the great falls of the Missouri, the Highwood in the n., and the low-lying Spoonbill, with many detached spurs and smooth-slooping buttes. This mountainous region constitutes about two-fifths of the surface, extending the entire length of the territory from n. to s., and for 175 m. e. of the w. boundary, the general elevation being much less in the n. than in the s. portion. Between these ranges are deep divides; around the spurs wind beautiful rivers; and picturesque cañons separate the buttes. In the s. portion, in the vicinity of the Yellowstone river, the mountains rise 11,000 ft. above the level of the sea, wearing a crown of perpetual snow, and in the n., beyond the Missouri, the mountain tops in early autumn are clothed in the blue of the sky, mingled with the purity of the snow, visible for many miles over level, treeless plains. Away from the strictly mountainous portion there are solitary peaks of basalt, tuff, and other volcanic rock, of material such that though presenting a rocky appearance, or one of great solidity, much of it can easily be cut with a knife. In the crevasses of the mountains, however, may be found green spots bearing pine, cedar and fir trees, and susceptible of cultivation, while the light-brown grass of the plain below, brown by contrast with the vivid green of the moister soil, furnishes nutritious food for the wandering herds marked with the ranchman's brand. A large proportion of its vast territory is taken up by Indian reservations, 24,156.800 acres being held in reserve for them, of which more than 10,000,000 acres are thought to be tillable land, and only 3,769 acres is under cultivation. Immense prairies and bottom-lands, smooth, rich, and green, await the plowman, untilled and unhabited. The print of the pony's fleet foot is the only mark on the soil, save the traces of a vanished "tepee," or the high stakes supporting the canvas shelf which holds the rattling bones of a dead Indian in his airy sepulcher.

The territory contains the head-waters of the Missouri, the Clarke's fork of the Columbia river, and the Yellowstone, a tributary of the Missouri, giving its name to the celebrated national Yellowstone park, which it irrigates and beautifies. These rivers and their branches permeate the entire territory, furnishing natural highways for the transportation of passengers and freight. Of the branches those of the Missouri are all of more or less interest on account of their association with late Indian troubles. The Big Horn, the Rose Bud, whose valley was the scene of Custer's last battle with the Dakotas under Sitting Bull, the Powder, Tongue, etc., flow into the Yellowstone, and the Marias, Milk, Muscleshell, Big Muddy, Judith, and Poplar rivers flow directly into the

Missouri. The Bitter Root river rises in the w., flowing n., sometimes in the latter portion called the Missoula. The Missouri, rising near Gallatin in the s.w., is formed originally of the Jefferson, Madison, and Gallatin rivers, and flows n.e. to Helena, following thence an e. course to Benton and the Dakota line. It is navigable by steamboats from April to September as far as fort Benton, 808 m. from the boundary line of Dakota, and efforts are being made to improve the bed of the stream as far as the falls between fort Benton and Helena. Government appropriations have been made for the building of dikes to keep the water in the channel, and more are confidently expected, as the traffic on the river is assuming weighty proportions. It is a difficult and tedious work, owing to the scarcity of material. The Yellowstone, rising in Yellowstone lake in n.w. Wyoming, is also navigable early in the season, and even so late as August, as far as the buffalo hunting grounds, 300 m. above its mouth. The Little Missouri crosses the s.e. corner, entering the Missouri in Dakota.

In its geological construction the azoic formations prevail in the w., and eastward first the jurassic appears, next the cretaceous, and near the Dakota line the tertiary. Along the base of the mountains are beds of jurassic and carboniferous rocks. Potsdam sandstone and brick-making clay are abundant, and there is some granite. Slate is found in large quantities in the placer-mining districts. In all sections the strata are much broken, and present formations of almost every geologic age. The plains, which at the mouth of the Yellowstone are 2,010 ft. above the level of the sea, rise gradually to 4,091 ft. at the base of the mountains, the elevation of the valleys varying from 3,000 to 5,000 feet. The cretaceous strata in the n. yield coal of the best quality, which is mined in the vicinity of Bannack, Helena, Virginia, Deer Lodge, and Benton, and there are evidences of its presence on the Missouri, Muscleshell, and Yellowstone. All kinds of petrefactions are found near the Missouri, snails, snakes, sea-serpents, buffaloes' bones, wood, etc.

Its most important mineral wealth is in its vast deposits of gold and silver, which are mined in every method from the modern scientific machinery of quartz-crushing and hydraulic mining, to the homely pan of the original "honest miner," with his little retort and crucible, quicksilver and rough sluice-boxes, vexed and worried by drought and flood. Gold was first discovered on a small creek w. of the main divide of the Rocky mountains, in 1852, contiguous to the site of the present town of Deer Lodge. In 1861 the first mine was opened, and in 1863 the first quartz mill was erected. The principal quartz mines are near Argenta, Bannack, and Helena, and the latter place and Virginia are the great mining centers. The Barker silver mines, 60 m. from Fort Benton, have been recently opened, and large quantities of ore were sent down the river to Omaha to be assayed in the autumn of 1880. Iron and coal, lignite, copper, and petroleum are found.

In the e. section there is much controversy as to which is the more susceptible to cultivation, the bench or the bottom lands, experiments having been made by the military and other residents along the rivers; but, subject to certain conditions of season and locality, either level has been found to be productive, furnishing excellent wheat land, and fine crops of turnips and the hardier vegetables are raised with very little labor. Groves of cottonwood, resembling the birch trees of the east, ash, and hickory grow on the banks of the Missouri, furnishing fuel for the steamers, being cut by a solitary woodman, and laid ready in long piles. It also supplies a convenient medium of exchange whereby the proprietor of the wood-yard procures his whisky, canned vegetables, and clothing. Thickets of willows are common, in which the tourist searches, frequently with success, for "diamond willow," the favorite wood for walking-sticks. At the Coal Banks, 85 m. from Fort Benton, a new government freight station, there is an elegant park laid out in serpentine paths, and furnished with rustic seats by the industry of the soldiers in leisure hours. Previous to the severe winter of 1881, the bunch, buffalo, and grama grass were sufficient food for stock throughout the year, and it was not considered necessary to provide shelter, but in that year the snow blocked all the roads for weeks at a time, cutting off all communication between principal points, and the thermometer registered 59° below zero at Fort Benton. Poor cottonwood sold at $15 per cord, and coal was 1 ct. per lb. In ordinary times a military telegraph gives all the facilities for rapid communication as far n. as Fort Benton. The climate is subject to great variations; in a journey of 150 m. a traveler may start in a linen duster and arrive in a fur coat, and a November sun shines with as much intensity as in July. Hay is made on the river bottom lands and carried into the interior, but little is required, except at the forts, and barns are little needed, the hay being stacked on the open prairie. Untoward circumstances have conspired to cause the failure of crops in certain seasons, but in the w. the Prickly Pear, Gallatin, and Bitter Root valleys, and in the n. the valley of the Teton and Sun River valley present a region unsurpassed for agricultural advantages. In the Bitter Root valley, called the Garden Valley of Montana, splendid apples (which sold at Fort Benton in 1880 for 80 cts. per lb.) and plums are raised, $20,000 worth of trees being imported annually from New York nurseries. Potatoes are raised weighing 2¼ lbs., 9x10 in. in size. This is a pleasant prospect for the country, the n. and e. depending principally on canned vegetables from the states. The valley lying n. and s. of Fort Owen is 3,284 ft. above the level of the sea, and is 80 m. long, varying from 5 to 10 m. in width. The soil is a rich dark loam. In addition to the main stream, many tributaries flow down from the mountains. Cottonwood and pine trees grow to a height, the former of 70 ft. and the latter of 150 feet. The Missoula valley is 15 m. wide for 30 m., is well wooded, and has a moderate climate. Prickly Pear valley, from 5 to 15 m. wide and 20 m. long, with beautiful smooth meadows, is in the vicinity of Helena. The valley of the Teton is from 2 to 6 m. wide, with bordering table-lands 75 ft. above the valley level, and is within easy distance of Fort Benton. Deer Lodge valley is 5,000 ft. above the level of the sea, and is 40 m. long and about 12 m. wide, with a central stream flowing through it, and rivulets running down from the mountains on either side. Sun River valley is from 1 to 3 m. wide. The stream is rather swift, and from the "crossing," on the road from Fort Benton to Helena, the valley is about 5 m. wide for 25 miles. The timber is cottonwood and ash. The Judith basin is 50 m. wide and 80 m. long, and is traversed by the Judith river and 3 tributaries, West Fork, South Fork, and Big Spring creek. In the area between these valleys are extensive cattle ranges, taken up by residents of the towns, and visited semi-annually. The bright-winged grasshopper, gay and harmless, is found skipping about on the plains, resembling the little butterflies of the states. Butter is found to be the most lucrative product of the farm; 150 lbs. a week were made in 1880 by the owner of from 40 to 60 cows. It sold at 50 cts. per lb. Prices for the necessaries of life approach nearer to those of the east than they did in Virginia City in 1861, when flour sold for $100 in gold per sack of 100 lbs. The pay of laborers on ranches is $35 a month; in the winter $30. Timber is most abundant in the n.w., particularly along the Flathead and Kootenay rivers.

Aside from the fascination of the gold and silver mines, which draws the prospector thitherward, the natural scenery of the territory attracts the tourist who seeks a new sensation. The Utah Northern railroad is creeping slowly but surely from the Union Pacific into the heart of the mining district, to Dillon and beyond, and millions of dollars' worth of freight lies at the terminus awaiting transportation, while in the season steamboats, some owned by the government and carrying the U. S. mail, others owned by private parties (some of them realizing a profit of $200,000 in 10 years), crowded with freight and passengers, steam up the Missouri from Bismarck, D. T., to Fort Benton, stopping at the Indian agencies of Poplar Creek, the inhabited point nearest the British Possessions, Wolf Point, Fort Berthold, and Fort Buford, in their sinuous course parting company with steamboats which go up the Yellowstone, the point where the rivers divide resembling the separation of the Monongahela and Alleghany rivers at Pittsburg. In ascending the river numerous abandoned forts are passed, and trading-posts and Indian encampments. Under the banks, which rise from 300 to 800 ft. above the level of the river, the boat may tie up for the night. The scenery is extraordinary; it is grand rather than charming. It silences, hushes, commands admiration; it is after awhile monotonous, but never trivial. These towering heights, these frowning parapets and stern dividing walls, are scarcely more enduring than the drifting sand-bars in the river's bed. They crumble and form again by the action of the atmosphere, slowly vanishing monuments of distant ages. Above the Yellowstone the river is narrow but the scenery is more varied, forming itself into castles and mediæval architecture. At Fort Benton coaches take the passengers into the mining region. The months of April, May, June, and July are the best to ascend the river; later the water is so low that much of the latter part of the journey must be by coaches. At any point on the river herds of buffaloes may be seen winding around the buttes or crossing the stream in the steamer's path. In June, 1880, between Fort Peck and Paradise valley, it was estimated that 20,000 were seen in one day; on another day 500,000. Deer and antelope seek the river in the morning. The national park, at the head of the Yellowstone, which is partly in this territory, contains geysers, thermal and mineral springs; hot springs are also found s. of the Main Divide. Flathead lake, 30 m. long and 14 m. wide, lies in the n.w. portion, in the region of the Flathead and Bannack Indians. The Flathead river is its outlet. It has dense forests of heavy timber, pine, tamarack, and fir growing to the edge of the lake, except on the extreme n., which is open grassy prairie, with much tillable land.

Wolves are often met on the prairie; grizzly bears, badgers, mink, otter, and marten are found in the forests, and beavers build their cabins on the river banks. The Indians start on the annual hunt, with all their tribe and appurtenances, about the middle of October, and may be seen traveling for long distances over the plains, fording streams and climbing mountains. They tan the skins of buffaloes and trade them for whisky, sugar, flour, tea, and canned vegetables, and strip up the flesh into jerked meat, or chop it into pemmican for winter subsistence. Whitefish, salmon, and trout are plenty in the streams; bulberries, which resemble red currants, grow by the rivers, and wild strawberries grow near Helena, ripening as late as November.

In the larger towns the manufacturing productions are rapidly increasing; the cost of transporting machinery, making the price of manufactured articles higher than that of the same articles imported from the states, has retarded the growth of industries, but flour, meal, lumber, jewelry, tinware, and bricks are largely manufactured, and malt liquors are made. The steam quartz mills, used principally for gold, and steam saw-mills, are a good investment. Bricks and logs are used for building. Freight transportation, trade with the Indians, and that which comes over the Canadian line, are the channels of commercial prosperity. Hardship and peril have accompanied the pioneer in mining, agricultural pursuits, gambling, cr legitimate trade, and the transition from the lawlessness which compelled the organization of the "Vigilantes," who administered justice without fear or favor, into a respect for individual rights, uninfluenced by sectional feeling, is slow and painful, but within a few years the most noted resorts of the border ruffian have become peaceful places of abode, and boards of trade have taken the place of gambling-houses.

There are several national banks, 2 having been established at Fort Benton in 1880, and a large number of private banking-houses. South of the Yellowstone is the reservation of the Crow Indians and the new Crow agency; in the w. are the Flatheads and Bannacks; in the n. and e. are the Blackfeet, Pend Oreilles, Gros Ventres, Assiniboins, Piegans, and Sioux, all of whom are friendly under certain conditions. Education, religious and secular, has as yet made only a beginning, but almost every settlement has a religious society, almost every village a newspaper, and nearly every town 2 or more churches. Missionaries are making great efforts to establish schools at the Indian agencies; they have 2 boarding schools and 4 day schools, and 1 will be opened by the Congregational denomination the present season at Poplar Creek. It is said that there are 142 professional scouts among the Montana Indians, but one of the most widely known and constantly employed, Wild Elk, is a Portuguese. Ministers of the Methodist, Roman Catholic, Episcopal, and Congregational order suffer great deprivation and fatigue in order to establish opportunities for religious instruction, and their efforts seem likely to be well rewarded. The Roman Catholics meet with great encouragement among the Indians, with whose language they make themselves acquainted. The professions are well represented, and find ample field.

The territory has over 90 secular schools. It is organized into districts, and Deer Lodge, Virginia, and Helena have graded schools. Helena has a Roman Catholic convent of high reputation as a seminary for young ladies; there are also a number of private schools in the territory, and many libraries annually receiving large additions. The town of Helena was burned on Jan. 9, 1874, loss $850,000, but it has outgrown all ill effects of the calamity. Newspapers are published in 9 out of the 12 counties, in 7 county-seats, and in 11 cities, towns, and villages; aggregate circulation over 14,000.

The territorial government meets at Helena biennially, and consists of a governor, secretary of state, district attorney, surveyor general, superintendent of Indian affairs, and U. S. commissioner and treasurer, all appointed by the U. S. government. The delegate to congress is elected by the people, has a voice in the deliberations of that body but no vote; the county officers are elected by the people. The legislature consists of 2 branches, a council of 12 members, and a house of representatives of 26 members, all elected by the popular vote. The district judge of the U. S. district court and 2 associate justices are appointed by the president of the United States. Its chief town is Helena; other important towns are Virginia City, Deer Lodge City, Fort Benton (commonly called Benton in recent years), Bozeman, Bannack City, Missoula, Diamond City, and Radersburg. The penitentiary is at Deer Lodge. Its counties are Beaver Head, Choteau, Custer, Dawson, Deer Lodge, Gallatin, Jefferson, Lewis and Clarke, Madison, Meagher, Missoula, and a new county, name unknown. It has 12 postal money-order offices, and 23 signal service stations. Capital, Virginia City.

MONTANELLI, GIUSEPPE, 1813–62; b. in Tuscany, and studied law in the university of Pisa, where he aftewards became professor of jurisprudence and commercial law. In the Italian revolution of 1848 he participated, and was for some time an Austrian prisoner. From that time until Tuscany became a part of Italy (1860) Montanelli took a very active share in the tumultuous political movements of the province, though for the greater part of the time compelled to remain outside its boundaries. He organized secret societies, wrote pamphlets and articles for the press, and in every way urged on the cause of Italian unity. He published his memoirs in 1853, wrote a number of lyric poems, and was the author of *Camma* and adapter of an Italian version of *Médée*, both tragedies being performed with Mme. Ristori in the title roles.

MON'TANISTS. See **Montanus**, *ante*.

MONTA'NUS, a celebated heresiarch of the early Christian church, was a Phrygian by birth, and made his first public appearance about 160 A.D., in the village of Ardabar, on the confines of Phrygia and Mysia. He was brought up in heathenism, but embraced Christianity with all the fanatical enthusiasm for which his countrymen were noted.

Montanus's standpoint was, *in theory*, the exact opposite of that occupied by the Gnostic sects; yet, *in practice*, it led to a similar exclusiveness and sectarianism. He believed in the constancy of supernatural phenomena *within* the church. The miraculous element, particularly the prophetic ecstasy, was not removed; on the contrary, the necessity for it was greater than ever. He considered those only to be true or perfect Christians who possessed the inward prophetic illumnination of the Holy Spirit—they were the true church; and the more highly gifted were to be looked upon as the genuine successors of the apostles, in preference to the mere outwardly consecrated bishops. Thus, they form a religious aristocracy, as arrogant as the Gnostics: the difference between the two simply being that the Montanists prided themselves on a kind of inflamed inspiration, and the Gnostics on a calm and serene illumination of the reason. Neither party wished to recede from the Catholic church, but rather to exist as an esoteric body within its pale. It was persecution, caused, no doubt, by their own insolent obstinacy, that forced them into a sectarian course. Montanus did not meddle directly with the creed of the church; in fact, he was not a thinker, nor a man of almost any importance intellectually. His efforts were confined to stirring up the Christians generally to fresh religious life—to a belief in a fresh outpouring of the Holy Ghost! At first, Montanus contented himself with predicting fresh persecutions, exhorting men to greater strictness and holiness of life, and announcing judgments to come upon the persecutors; but his idea of his own mission afterwards became more exalted, and he claimed to be in a very special sense a prophet of God—the organ chosen by the Holy Ghost to purify, enlighten, and advance the church. Among the things on which the Montanists laid stress was an ascetic mode of life, scorn of persecution, and love of martyrdom; connected with these, and, indeed, flowing from them, was an aversion to second marriages, and to the restoration of the LAPSED (q.v.). Like other enthusiasts, they also were firm believers in the near approach of the millennium (q.v.) and in the personal advent of Christ. Two "prophetesses," Priscilla and Maximilla, were associated with Montanus in his work. A decree for the expulsion of Montanus and his followers from the communion of the Catholic church was issued by Eleutherus, bishop of Rome. The Montanists at once proceeded to organize themselves as a distinct sect. They found a singularly able apologist in Tertullian (who became a Montanist about 200 A.D.), and continued to exist till the 6th century.

MONTA'NUS, ARIAS. See ARIAS MONTANUS, *ante.*

MONTARGIS, a t. of France, department of Loiret, is situated at the junction of the canals of Orleans and Briare with that of Loing, 40 m. e.n.e. of the city of Orleans. Montargis has some cloth and leather manufactures and considerable trade in corn, cattle, etc. Pop. '76, 9,175. In its vicinity is an extensive forest of the same name.

MONTAUBAN (Lat. *Mons Albanus*), a t. of France, capital of the department of Tarn-et-Garonne, is situated in a rich and beautiful country on a plateau between the rivers Tarn and Tescou, 32 m. n. of Toulouse. It is the seat of a bishop, has a fine cathedral in the Italian style, finished in 1739, built on the site of a still older monastery, the *Mons Aureolus* (Golden Hill), and is a well-built, handsome town. The houses are mostly of brick. Besides having considerable manufactures, it carries on a great trade in wine, grain, leather, etc. Montaubon was founded in 1144 by count Alphonse of Toulouse, became the seat of a bishop in 1317, embraced the reformation in 1572, and suffered severely in the civil wars that ensued. It has acquired historical celebrity as the great stronghold of the Huguenots. Protestantism still exists here, and maintains both an academy and a theological college. Pop. '76, 19,790, nearly one-half of whom are Protestants.

MONTAUK POINT, a promontory at the e. extremity of Long Island, in the state of New York. It is in the township of East Hampton, about 7 m. from Sag Harbor, in Suffolk county, lat. 41° 4' n., long. 71° 51' 54" w. It is a light-house station, with a fixed light (160 ft. above the level of the sea, in a stone light-house), and a fog-horn. It was named for a tribe of Indians which, much reduced in numbers, inhabits the vicinity.

MONTBELIARD (Ger. *Mömpelgard*) a t. of France, in the department of Doubs, 36 m. n.e. of Besançon. It lies in a valley between the Vosges and Jura mountains, is surmounted by an old château, now used as a prison, and carries on manufactures of cotton goods, hosiery, and silks. Clocks, watches, and agricultural implements are also made. Pop. '76, 7,625.

MONT BLANC, the highest mountain in Europe, and, according to the latest measurements, 15,781 ft. above the level of the Mediterranean sea, is one of the Graian Alps, and is situated in the department of Haute-Savoie, France, close to the Italian frontier, and 37 m. s. of the e. end of the lake of Geneva. The vales of Chamouni and Mountjoie lie on the w., and those of Ferret and Allée Blanche on the e. side of it. The waters which spring from its western slopes are drained off to the Arve, and thence to the Rhone, while those which rise on the e. side are feeders of the Dora Baltea, a tributary of the Po. It has 3 snow-clad peaks, and 36 glaciers, of which 16 lie on the n., and 20 on the s. side. The highest summit is a narrow ridge 50 yards by 16, called *La Bosse du Dromedaire*, covered with firm snow, and very steep towards the north. In 1760 Saussure offered a prize for the discovery of a practicable route to the summit of Mont Blanc, which was gained, in June 1786, by Jacques Balmat, a guide. Saussure himself ascended the mountain the following year; and the same feat has since been performed by many, especially since Albert Smith published the well-known pictorial and dramatic description of his ascent in 1851.

MONTBRISON, a t. of France, capital of the department of Loire, 37 m. s.w of Lyons, on the Vizezy, a feeder of the Loire, stands at the base of a lofty and precipitous rock. In the vicinity are mineral springs. Pop. '76, 5,959.

MONTCALM, a co. in s. central Michigan; 720 sq.m.: pop. '80, 33,148—27,500 of American birth. The surface is undulating, and covered with a heavy growth of timber. The pine and the sugar-maple abound. The soil is rich, and produces good crops of Indian corn, wheat, oats, potatoes, and grass. Other staples are wool, butter, and maple sugar. The manufacture of lumber is extensively carried on, and there are many saw-mills. Other manufacturing industries are boots and shoes, flour, sashes and blinds, and carriages. It is drained by the affluents of the Chippewa, Grand, and Muskegon rivers, and is traversed by the Grand Rapids and Indiana, Detroit, Lansing and Northern, and Saginaw Valley and St. Louis railroads. Co. seat, Stanton.

MONTCALM, a co. in s.w. Quebec, Canada, n. of the St. Lawrence river, watered by the North, Du Lièvre, Rouge, Lac Ouareau, and Gatineau rivers; 4,027 sq.m.; pop. 12,742—10,794 of French, 1557 of Irish descent. The surface is diversified and the principal productions are grain, cattle, and lumber. Co. seat, St. Julienne.

MONTCALM DE CANDIAC. See CANDIAC, *ante*.

MONTCALM DE SAINT-VÉRAN, LOUIS JOSEPH, Marquis de, b. near Nismes. 1712; entered the army at the age of 14, at 18 was a capt., served in Italy and Germany for many years, and was wounded at the battle of Piacenza in 1746. He became a field officer in 1756, and was sent to Canada in May of that year to make head against the English. He captured fort Ontario at Oswego in August of the same year. The next season he forced the capitulation of fort William Henry at the head of lake George, with an English garrison of 2,500 men, capturing 42 guns and a large amount of stores. In 1758 he defended fort (Carillon) Ticonderoga with 3,600 Canadians, against gen. Abercrombie at the head of 15,000 English, which resulted in a bloody repulse of the latter after an attack of determined vigor. Lack of troops, ammunition, and provisions, and the large re-enforcements of the English, obliged Montcalm to retire all his forces the following year to the defense of Quebec, menaced by a powerful army under gen. Wolfe. The struggle for that stronghold began July 31, 1759, by an attack, which was repelled. The siege was then continued for six weeks without any success on the part of the English, when Wolfe conceived a new plan of operations and succeeded in secretly scaling the cliffs above Quebec with his entire army, and on Sept. 13 appeared on the heights of Abraham in the rear of Quebec. Montcalm promptly prepared for battle in the open field, and at 10 o'clock led the attack in person. His troops, however, were not veterans and the English were. The English assumed the offensive. Wolfe fell dead in the moment of victory, and Montcalm was borne from the field mortally wounded. When told he must die he said: "It is well; I shall not live to see the surrender of Quebec." The city was not surrendered till several days after his death. In 1827 governor Dalhousie, of Canada, caused a monument to be erected in Quebec to the joint honor of the two brave generals who fell on the field where France lost and England won the Canadas.

MONT CENIS. See CENIS.

MONT CENIS TUNNEL. See TUNNEL, *ante*.

MONTCLAIR, a t. in Essex co., n.e. New Jersey, on the New York and Greenwood Lake railroad, and a branch of the Delaware, Lackawanna and Western; pop. '80, 5,146. It is 5 m. n.w. of Newark, and 13 n.w. of Jersey city. It has various manufacturing interests. It lies on the southern and western slope of Orange mountain, with fine view of New York, Brooklyn, and adjacent cities; has much rural beauty, and has attracted a refined and cultivated population.

MONT-DE-MARSAN, a t. of France, capital of the department of Landes, at the junction of two streams—the Midou and Douze—which, when united, take the name of Midouze, and join the Adour. It is 65 m. s. of Bordeaux, with which and with other places it is connected by railway. The town has of late years made great progress. It has a communal college and mineral warm baths. There are manufactures of common woolen cloths, blankets, sail-cloth, and leather. Pop. '76, 8,238.

MONT DE PIÉTE, called in Italy MONTE DI PIETÁ, a charitable institution, the object of which is to lend money to the very poor at a moderate rate of interest. It had its origin at the close of the mediæval period, when all such transactions were in the hands of usurers, to whom the necessities of the poor were but an inducement to the most oppressive extortion. The earliest of these charitable banks appears to have been that founded at Padua in 1491, which was so successful as to lead, according to contemporary writers, to the closing of the Jewish banks in that city. The first opened at Rome was under Leo X.; and the Roman monti di pietá are confessed to have been at all times the most successful and the best managed in Italy. The institution extended to Florence, Milan, Naples, and other cities. The principle of all was to advance small sums on the security of pledges, but at a rate of interest barely sufficient to cover the working expenses. Should any surplus remain, it was to be expended for charitable purposes. The mont de piété system was introduced also in Spain, France, Belgium, Germany, and the Netherlands. In 1873 there were in France 46 monts de piété, making yearly loans of 60,000 francs. It formed the model of the loan fund board of Ireland, established by 6 and 7 Vict. c. 91. See PAWNBROKING.

MONT DE PIÉTÉ (*ante*). This institution originated with Francisco di Viterbo, a Minorite friar, in the 15th c., in Padua. He preached publicly against usurers, particularly the Jews, who had the most of that business in Europe; and though opposed even by some of the church orders, notably the Franciscans, he succeeded in inducing the pope to issue a bull in his favor, when opposition died out. The monk's plan was that the rich should combine to assist the poor, by lending them money without interest on pledges or pawns. The idea became popular, and the institution spread to Assisi, Mantua, Parma, Naples, and Rome; and soon these establishments gained a foothold in Germany, France, and Russia. They were known under different names: "Lombard houses," "mons pietatis," "mons de piété," "banco di rovere," etc. In Rome, Gregory XIII. established a bank of deposit specially for widows and orphans, whose deposits were guaranteed by a lien on the goods of the bank. Sextus V. added to this permission to deposit goods and articles of any value and of every description. Soon this bank reached a height of wealth and power unexampled in the history of such institutions, and was frequently enabled to loan immense sums to states and sovereigns. In Turin the Jews held the money power, and 30 per cent was a common rate of interest among them. In 1519 a mont de piété was established there and the system of extortionate interest was broken up as a result. But this institution was unable to sustain itself, from the fact of charging no interest, and would have failed but that the *compagnie de St. Paul* came to its rescue with the suggestion of a charge of 2 per cent, on which basis it continued business with success. This establishment continued in existence until near the close of the 18th c., when it succumbed to the political convulsions of the period: it was, however, revived in 1822. The mont of Milan was formed by the union of 36 private establishments, and became one of the largest in Italy. It is now nearly 500 years old. In 1833 the capital of this establishment was 671,000 Austrian livres. Among the earliest monts in Italy was one at Cremona for lending corn at interest; it was called the *mons frumenti pietatis.* The custom of charging interest, which has obtained among monts de piété ever since, was licensed in 1515, when the Lateran council in Rome decided that these banks could lawfully charge a sufficient percentage for the use of their money to cover their expenses. At Rome the charge was about 6½ per cent per annum, but this charge has been greatly increased in most of the Italian cities. When Napoleon entered Italy in 1796 he robbed the mons de piété of many valuable treasures. The establishment of monts de piété in France began in the latter part of the 17th c., the first one being at Marseilles in 1695. One appeared in Paris in 1726 in the reign of Louis XIII., but soon failed. In 1769 Turgot tried to re-establish it, but without success; and it was not until the period of Necker's financial administration that it became firmly fixed as a permanent institution. Five years after the establishment of this mont, there were more than 40,000 watches in its vaults. Next to the Paris mont, those of Lyons and Marseilles are rated most important. A mont de piété was established in Copenhagen, Denmark, in 1688, and flourished in private hands until 1753, when it was purchased by the naval hospital for 6,000 rix bank dollars: about $3,000. The rate of interest throughout Scandinavia has been from 9 to 12 per cent. The first monte pio in Spain was opened at Madrid in 1703, and in 1773 an attempt was made to place it in the hands of the government, but without success. The capital of the montes of Valencia, Malaga, and Galicia was at first derived from vacant benefices, termed *espolios y vacantes.* The two Russian monts were established in 1772—"to put an end to the devouring cupidity of the usurers, by offering prompt assistance to those who are so unfortunate as to be suddenly thrown into need." The income over expenses derived from these monts has been devoted to the support of the foundling hospitals, always an object of fostering care on the part of the Russian government. The rate of interest was originally 6 per cent, was afterwards doubled, and finally again reduced, this time to the legal rate. It has always been a Russian custom to deposit plate and other valuables with the mont for safe-keeping; and in 1813, when Napoleon marched on Moscow, the amount loaned by the establishment in that city was more than five times the average sum. In 1817 the St. Petersburg mont lost by a defalcation more than $1,000,000. The mont de piété has never been successfully established in Great Britain; one was opened in the city of Limerick, Ireland, in 1837, and was useful in ameliorating the condition of the poor while it lasted; but it did not become permanent, and the private pawnbroker has always occupied the field in the British Islands. There is no record of any institution of the character of the mont de piété having been established in the United States. The distinction between this institution and the ordinary pawnbroker's shop should always be sharply drawn; the one is a beneficent institution, designed to accommodate the poor in the first instance, and, after payment of expenses, to devote any surplus to the sustenance of some charity or public work; the other is simply a business enterprise, conducted for private profit. See PAWNBROKER, *ante.*

MONTEBELLO CASTEGGIO, a village of northern Italy, in the province of Pavia, 23 m. e.n.e. of Alessandria. It stands in a plain on the banks of the torrent Schizzola. Here the Austrians were defeated by a French army under gen. Lannes, after a desperate conflict, June 9, 1800. The title of duke of Montebello was conferred on the victorious French general five years later. In May, 1859, the Austrians were again defeated here by the united armies of the French and Piedmontese. See CASTEGGIO.

MONTE-CASI'NO. See CASINO, MONTE.

MONTE-CATINI, a village of Tuscany, situated on a spur of the Apennines, 29 m. w. of Florence, derives its name from the bowl-shaped hill on which it stands. It is of very ancient origin, and was formerly called *Castello.* In the close vicinity of the town are the famous mineral springs of the same name, in high repute for their curative properties, especially in diseases of the liver and digestion. Excellent accommodation can be had by visitors both in private establishments and those under government direction.

MONTECATINI DI VAL DI NIÉVOLE, a t. in Italy, 20 m. e. of Lucca; pop. 6,791. Its mineral springs are much frequented by invalids, and have a high reputation throughout Europe.

MONTÉ-CHI'ARO, a t. of northern Italy, in the province of Brescia, situated on a height on the left bank of the Chiese, in the center of an amphitheater of hills. Pop. 6,933. The chief manufacture is silk. In 1796 the Austrians were defeated here by a French army.

MONTÉ CHRISTO, a small island, belonging to Italy, 26 m. s. of Elba. It consists of a mountain of granite 1983 ft. above the level of the sea, and is uninhabited except by wild goats and other animals. It is inaccessible except by one narrow landing-place. Monte Christo has given name to Dumas's well known novel.

MONTECUCULI, RAIMONDO, Count, b. near Modena, 1608, and entered the Austrian artillery as a volunteer under his uncle, Ernesto, count Montecuculi, in 1627. During the Thirty Years' war he found many opportunities of distinguishing himself, received rapid promotion, and was employed in various services, military and diplomatic. In 1657 he was sent to support the king of Poland, John Casimir, against the Swedes and Rákóczy, which he did with great effect, compelling Rákóczy to make peace with Poland, and to break his alliance with the Swedes. In the following year he was made a field-marshal, and was sent to aid the Danes against the Swedes, in which also he was eminently successful. In 1660 he commanded the army sent to oppose the Turks, who had broken into Transylvania, and skillfully kept them in check till the arrival of the French, with whose assistance he won the great battle of St. Gotthard, on the banks of the Raab, Aug. 1, 1664—the first decided triumph of European tactics and discipline over the mere numbers and daring of the Ottoman hosts. When the war broke out between France and Holland, in which the emperor took part with Holland, Montecuculi received the command of the imperial army in 1672. He took Bonn, and notwithstanding the endeavors of Turenne to prevent it, effected a junction with the prince of Orange. In 1675 he was opposed to Turenne on the Rhine, and they spent four months in maneuvers in which neither could gain any advantage. After this campaign, Montecuculi spent the remainder of his days at the imperial court and in the society of learned men. He was himself a man of learning and various accomplishments, and has left works on the art of war, on the Turkish war, and on the war of 1664, and also sonnets. The emperor Leopold made him a prince of the empire, and the king of Naples bestowed on him the duchy of Melfi. He lost his life by the fall of a beam as he was entering Linz with the imperial court, Oct. 16, 1681. His writings were published in the original Italian by Ugo Foscolo (2 vols. Milan, 1807); and by J. Grassi (2 vols. Turin, 1821). A semi-autobiographic memoir was translated into Latin, and published at Vienna, under the title of *Commentarii Bellici*, in 1718.

MONTEFIORE, Sir MOSES, b. London, 1784; from a wealthy Jewish family of bankers; married, in 1810, a connection of the Rothschilds. In 1829 he visited Palestine, became interested in the Jews in that country, and thereafter devoted himself greatly to their benefit. He also assisted the Jews in Poland; and throughout his life has been earnest in the conduct of plans for the amelioration of the condition of his race. In 1846 he succeeded in influencing the czar Nicholas in their behalf; and in 1863 obtained a firman from the emperor of Morocco which afforded protection to the Jews in his dominions. He endowed a Jewish college at Ramsgate, England, in 1867, in memory of his wife, who had died five years before.

MONTE GO BAY, a small but flourishing seaport on the n. coast of the island of Jamaica, 17 m. w. of Falmouth. It has a harbor protected by a breakwater, is defended by a battery, and carries on a general trade of some importance. More than 100 vessels annually enter and clear the port. Population variously stated at from 4,000 to 5,000.

MONTE'GUT, ÉMILE, b. at Limoges, 1824, and educated there. He was a student of law when his first step into the literary world was made by an article contributed to the *Révue des Deux Mondes* on the philosophy of Ralph Waldo Emerson. He soon afterwards became one of the editors of the review; his contributions ranging through light literature, foreign *critiques*, and politics, until 1848, when social and political subjects dominated, and were treated with little breadth of view. He soon resumed the study of English and American literature, and afterwards devoted his pen to contemporaneous French writings. From 1862 to 1870 he was associate editor of the *Journal de Paris*, and thereafter again editor of the *Révue des Deux Mondes*. His style is described as clear, trenchant, and of narrow view. He has translated into French Emerson's philosophical essays, with an introduction; Macaulay's history of England, and Shakespeare's works with commentaries and notes; and is author of a considerable number of original works.

MONTELEÓNE DI CALÁB'RIA, a t. in Calabria, 15 m. n.e. of Nicotera; pop. 11,840. It is situated on a high hill, commanded by a castle; the streets are irregular, and the houses mostly of wood. There is a college, and 4 churches, which contain some good paintings. Silk is manufactured to some extent, and there is some trade, but the principal occupation of the inhabitants is tunny-fishing. The t. was founded in the 13th c., and stands near the site of the ancient Vibonium or Hippo.

MONTELÉPRE, a t. in Sicily, 13 m. w. of Palermo. Pop. 5,706. It contains a fine feudal castle, and many rare Phenician and other ancient coins are found near it.

MONTÉLIMAR, an ancient t. of France, in the department of Drome, about 2 m. from the left bank of the Rhone, and 26 m. s. of Valence. It stands on the slope of a hill covered with vineyards. There are factories for silk and cotton goods, tanneries, etc. Pop. '72, 7,737.

MONTEM CUSTOM was a triennial procession of the Eton boys, on Whit-Tuesday, to a certain mound (*ad Montem*) known as the Salt hill, near the Bath road, and which was doubtless so called because certain of the boys levied tribute (for *salt* as the phrase went) from every person present, and even from any chance passer. These juvenile taxgatherers were attired in fancy dresses of silk. The king and queen, besides many members of the nobility, frequently honored the procession with their presence; and on such occasions, as much as £1000 has been collected, which was given to the senior scholar to support him at Cambridge. The origin of the custom is unknown. It was discontinued in 1847.

MONTENE'GRO (an Italian translation of the native name CZERNAGORA, "Black Mountain") is a small but independent and recently extended principality situated between Bosnia and Albania. Till 1878 it was separated from the Adriatic by a narrow strip; now it touches the coast for a short distance at Antivari, its only port, which is closed to the navies of all nations—Montenegro being prohibited from having war-ships. Montenegro contains above 2,000 sq.m., and is everywhere mountainous, the mountains being in most cases clothed with dark forests of fir, ash, beech, oak, ilex, willow, and poplar. Mt. Dormitor, in the n., is 8,200 ft., and Mt. Kom, in the e., 8,000 ft. above sea-level. Agriculture is prosecuted to the utmost extent the country will admit of, but in a rude and primitive manner. The products are those of other European countries in the same latitude. Few oxen are reared, but sheep, goats, and swine abound.

There are no towns in Montenegro save in the recently conceded portion: of them, Podgoritza (pop. 7,500) and Antivari (pop. 3000) are the only ones worthy of mention. Cettigne or Cettinji, the seat of government, contains above a hundred houses, many of them well-built, besides a convent and the palace of the prince of Montenegro. The villages are unwalled; the houses, or rather huts, which compose them, are rarely provided with chimneys, and in the elevated districts are more wretched in appearance than even the mud hovels of Ireland.

The Montenegrins or Tzernagorzes are Slavs of the Servian race, and number about 130,000. They are knit together in clans and families, and have many feuds amongst themselves, which are perpetuated by the hereditary obligation of avenging blood. Their chief occupations at home are agriculture and fishing, but they are ever ready for war or pillage. Education among them is at a very low ebb; in fact, it is held in contempt, and many, even among the priests, are unable to read or write. In 1841 several schools were established, and the art of printing introduced; but the unsettled state of the country has hitherto prevented much improvement. Their language is a very pure dialect of the Slavic. They belong to the non-united Greek church. In 1871 the first newspaper in Montenegro was established.

Political Divisions and Government.—Montenegro is divided into the districts of Montenegro proper, and Brda or Zjeta, each of these being subdivided into four "nahies" or departments, and these are further subdivided, each subdivision having its own hereditary chief. Besides, there are the newly added territories, not yet organized. Until 1851 the head of the government was the vladika ("metropolitan," or "spiritual chief"), who, besides his proper office of archbishop and ecclesiastical superior, was at the same time chief ruler, lawgiver, judge, and military leader. This theocratic administration became (1697) hereditary in the Petrovitch family, but as the vladika cannot marry, the dignity was inherited through brothers and nephews. Since 1851 the two offices have been disjoined, and the vladika is restricted to his ecclesiastical office, while the cares of government devolve upon the "gospodar" ("hospodar") or lord, though the common people still apply to him the title "sveti gospodar," which properly belongs to the vladika alone. The vladika Pietro II. (1830–51) established a senate of twelve members, elected from the chief families of the country, and in this body the executive power was vested. Next to the vladika in ecclesiastical affairs is the archimandrite of the convent of Ostroc. The other public officers, as the secretary of state, the chancellor, and the local judges, are appointed by popular election. From time to time an *assembly* of all the adult males of the country takes place in a grassy hollow near Cettigne, the capital; but the powers of this assembly are very undefined. For defraying the expenses of government, taxes are levied on each household, the income thus raised amounting to 40,000 Austrian florins, or £4,068. Besides this the prince receives from Russia a subsidy of 8,000 ducats (£3,733), and from Austria 20,000 florins (£2,000). As the Montenegrin, even when engaged in agricultural operations, is always armed with rifle, yataghan, and pistols, an army of 26,000 men can be summoned on the shortest notice, and in desperate cases 14,000 more troops can be raised. Their intense love of independence, and heroism in the defense of their country, is worthy of the highest respect; but out of their own country they are savage barbarians, who destroy with fire and sword everything they cannot carry off.

There is little trade in Montenegro, yet hides, wool, venison, dried and smoked fish, mutton, and goat flesh, bacon, lard, etc., are exported in considerable quantities. These goods are carried to Cattaro by the women, aided occasionally by mules, for, owing to the absence of roads (a precaution against invasion), carts are unknown. Austrian and Turkish coins form the currency, as Montenegro has no mint of its own.

History.—Montenegro belonged in the middle ages to the great Servian kingdom, but after the dismemberment of the latter, and its conquest by the Turks at the battle of Kossovo (1389), the Mentenegrins, under their prince, who was of the royal blood of Servia, maintained their independence, though compelled to relinquish the level tracts about Scutari, with their chief fortress of Zabliak, and confine themselves to the mountains (1485). In 1516 their last secular prince resigned his office, and transferred the government to the vladika. The porte continued to assert its claim to Mentenegro. and included it in the pashalic of Scutari; but the country was not conquered till 1714, and on the withdrawal of the Turks soon afterwards, it resumed its independence. In 1710 they had sought and obtained the protection of Russia, the czar agreeing to grant an annual subsidy on condition of their harassing the Turks by inroads, and this compact has, down to the present time, been faithfully observed by both parties. Another part of the agreement was that the archbishop or vladika was to be consecrated by the czar. In 1796 the prince-bishop, Pietro I., defeated the pasha of Scutari, who had invaded Montenegro, with the loss of 30,000 men: and for the next quarter-century we hear no more of Turkish invasions. The Montenegrins rendered important aid to Russia in 1803 against the French in Dalmatia, and took a prominent part in the attack on Ragusa, the capture of Curzola, and other achievements. Pietro II., who ruled from 1830 to 1351, made great efforts to civilize his people, and improve their condition. He established the senate, introduced schools, and endeavored, though unsuccessfully, to put an end to internal feuds, and predatory expeditions into the neighboring provinces. Some Turkish districts having joined Montenegro, the Turks attacked the latter in 1832, but were repulsed. A dispute with Austria regarding the boundary resulted in a war, which was terminated by treaty in 1840. In 1851 the last prince-bishop died, and his successor, Danilo I., separated the religious from the secular supremacy, retaining the latter under the title of gospodar. This step caused the czar Nicholas to withdraw his subsidy (which was renewed, and the arrears paid, by the czar Alexander II.), and the imposition of taxes thus rendered necessary caused great confusion. This was taken advantage of by the Turks, who, under Omar Pasha, invaded the country; but the intervention of the great powers compelled a treaty, Feb. 15, 1853. Danilo went in vain to the Paris conference in 1857, seeking the recognition of Montenegro as independent. In 1860 the Montenegrins excited an insurrection against the Turkish rule in the Herzegovina, which was soon suppressed, and in return they were so hard pressed by the Turks that they were glad to agree to a treaty (1862), by which the sovereignty of the sublime porte over Montenegro was recognized. Fresh complications caused Montenegro to declare war against Turkey in Jan., 1875, but a compromise was effected. Montenegro, however, supported the insurrection against Turkey that broke out in the Herzegovina a little later, and in July, 1876, was again at war. The Montenegrins co-operated with the Russians against their hereditary enemy during the war of 1877–78; and the Berlin conference (1878) recognized the independence of Montenegro, and agreed to an important extension of Montenegrin territory.

MONTENOTTE', a small village of northern Italy, 26 miles w. of Genoa, where the Austrians were defeated by the French on April 12, 1796.

MONTEPULCIA'NO, a city of Italy in the province of Siena, situated on a high hill, s.s.e. of Florence. Pop. about 3,000. Numercus Etruscan remains have been excavated in the neighborhood. The wines of Montepulciano are famous.

MONTEREA'LÉ, a t. of s. Italy, in the province, and 14 m. n.w of the town, of Aquila. Pop. 5,014. It stands on a hill in the midst of a vast plain, and has several elegant churches. There are vast chestnut-groves near Montereale, which furnish the poor inhabitants with the chief article of their subsistence.

MONTEREAU, a t. of France, in the department of Seine-et-Marne, at the confluence of the Seine and Yonne, 46 m. s.e. of Paris, with which there is communication by steamboat. The manufactures are earthenware and leather. Here, in 1419, Jean-sans-Peur, duke of Burgundy, was assassinated, at the instigation and in the presence of the dauphin, afterwards Charles VII.; and in the immediate vicinity Napoleon, Feb. 18, 1814, gained his last victory over the allies. Pop. '76, 6,847.

MONTEREY, a co. in w. California, between the coast range of mountains on the e. and the Pacific ocean on the w., drained by the Salinas, Carmel, and Benito rivers, and crossed by the Southern Pacific railroad; 4,536 sq.m. in 1874; pop. '80, 11,302—8,637 of American birth. The surface is intersected by several mountain ranges, and divided into the three great valleys of the Carmel, Benito, and Salinas. It is sparsely wooded except in the w.; along the coast fruit raising and cattle raising are extensively pursued. The great staples are wheat, barley, and wool. Next in importance are cheese, butter, and peas and beans. San Benito county was set off from the e. part of this county in 1870. Co. seat, Salinas.

MONTEREY', a village in Monterey co., Cal., 84 m. s.e. of San Francisco, on the Monterey and Salinas Valley railroad. Pop. '75, 1112. It has a good harbor, and a line of steamers plies between it and San Francisco. It was the capital of the Mexican province of California, and is now the co. seat of Monterey county. It gives name to a Roman Catholic diocese.

MONTEREY', the most thriving city of northern Mexico, capital of the state of Nuevo Leon, on the San Juan, a tributary of the Rio Grande, 175 m. w. of Matamoras. It is well paved and clean, stands on a broad plain, 1626 ft. above sea level, and is surrounded by beautiful gardens and orchards. Pop. in 1869, 13,500. From its situation its facilities for commerce are great; and it is the entrepôt for the transport of American goods from the Rio Grande to the inland states of Durango and Zacatecas. In the war between the United States and Mexico, Monterey capitulated, Sept. 24, 1846, after a siege of four days, to the American forces under gen. Taylor.

MONTEREY, BATTLE OF, occurred in the beginning of the war between the United States and Mexico, and is so named from the Mexican city before which it took place. General Zachary Taylor, who had occupied Matamoras on May 18, 1846, and had there been re-enforced, marched southward along the main highway into the interior, and sat down before Monterey, the key of the northern provinces of Mexico, on Sept. 9, with about 6,500 men. The city was strongly fortified, and garrisoned by about 10,000 Mexicans under the command of gen. Ampudia. The bishop's palace, standing on an eminence w. of the town, had also been fortified, and the position was esteemed difficult of capture, if not impregnable, to so small a force as was comprised in gen. Taylor's army. The attack was opened on the part of the Americans on Sept. 21, and on the following morning a sharp assault was made on the bishop's palace by general Worth's command. That position being taken, after a stout resistance, the city was forced, and a fierce running fight ensued, the Mexicans resisting stubbornly, as the Americans drove them from square to square, to the center of the city. The battle lasted two days, but on the 24th, gen. Ampudia surrendered the city and garrison. This being the first success of the American arms, and being achieved under peculiar disadvantages of relative position and number of men, greatly encouraged the United States soldiers, and stimulated them to renewed daring, while it was viewed by the American people as auspicious of a successful conclusion to the war.

MONTE RO'SA, the *Mons Sylvius* of the ancients, is the highest mountain in Europe after Mont Blanc. It is situated in the angle where the w. end of the Pennine meets the Lepontic Alps, and separates the canton of Valais from Italy. The northern portion of the mountain is highest, and forms nine peaks, the highest of which is forked and precipitous, and attains an altitude of 15,210 feet above sea level. Many attempts were made to ascend this peak, but none were successful till 1855. The mountain appears to consist of mica-slate, in some places alternating with gneiss. It is rich in metallic ores, and several mines of gold, copper, and iron are worked. The highest mine is between 10,000 and 11,000 feet above sea-level, and in the region of perpetual snow. Rye ripens up to an elevation of 6,000 feet; and the vine is found as far up as 3,200 feet; but there is a difference of nearly 1000 feet in the altitude of the corresponding vegetation on the n. and s. sides.

MON'TE SAN GIOVAN'NI CAMPA'NA, a t. in Italy, in the province of Rome, s.e. of Frosinone; pop. 5,988. It occupies a commanding situation on a hill, and contains many well preserved mediæval edifices. It was once a fief belonging to the house of Aquivas, and the prison of St. Thomas is still pointed out to visitors.

MONTÉ SAN GIULIANO, a t. of the island of Sicily, province of Trapani, situated on a high mountain 4 m. e.n.e. of the town of Trapani. On the mountain (anciently *Eryx*) are the remains of a once famous temple of Venus. Pop. 6,250.

MONTÉ SANT' ANGELO, a city of southern Italy, in the province of Foggia (formerly Capitanata), 28 m. n.e. of Foggia. It stands on one of the Gargano group of hills, at a height of 2,790 ft., and has numerous fine churches. It is famed for its exquisite honey, gathered from the odoriferous alpine plants of the mountain. Pop. 14,986.

MONTÉ SARCHIO, a t. of southern Italy, in the province of Benevento, 13 m. n.w. of Avellino, on the torrent Correo. Pop. 5,600.

MONTESI'NOS, FERNANDO, about 1600-52; b. Spain; went to Peru while a youth, and eventually became a member of the supreme administrative council at Lima. While employed in this capacity he studied the history and archæology of the country, and wrote *Memories Antiquas Historiales del Peru*, which was translated into French in 1849 by Ternaux-Compans. Prescott, the historian, speaks of him as a writer "who shared largely in the credulity and love of the marvelous which belong to an earlier and less enlightened age."

MONTESPAN, FRANÇOISE ATHÉNAÏS DE ROCHECHOUART DE MORTIMAST, Marquise de, 1641-1707; second daughter of the first duke of Rochechouart. She received a good education at a convent, and appeared in society first under the name of Mlle. de Tonnay-Charente, the name of the château where she was born. Beautiful, witty, and fascinating in conversation, she was soon chosen one of the ladies in waiting of the court of Versailles, where she became a companion of Mlle. de Vallière, who occupied the same position, and was mistress before her of Louis XIV. She married the Marquis de Montespan in 1663, by whom she had a son. It was the queen who was first so fascinated by the charm of her manner that she called the Marquise to be her companion. In 1668, when her age was 27, the monarch openly recognized both her and Mlle. de Vallière as mistresses, and his queen seemed not the less fond of them. Montespan, who was by far the most powerful and ambitious of the two, maintained for ten years a strange control in state affairs, and retained the joint affections of king and queen; often appearing on state occasions in the carriage with the latter. She was admitted by all to be the most beautiful lady of the court. An abundance of fair blonde hair, expressive blue eyes, dark eyebrows, a complexion of exquisite delicacy, a form full and graceful, and "an air that lighted the spot where she appeared," was the inventory of her personal attractions. Her humors as she acquired power became violent and changeable, and her influence declined. During the ninth year of her *liaison*, Mme. de Maintenon, who was in the service of Montespan as governess of her son, and whose more gentle temper pleased the king, began to supplant her, so that in 1679 the king no longer was under her influence. She retained her place at court till 1691. In 1700 she met the king for the last time at court, and soon afterward followed the fashion of the time and became a religious devotee; but not until she had written a tender letter to her husband, begging him to allow her to return to him, and had been refused. By the king she had two sons, the duc de Maine and the compte de Vexin; three daughters, who lived to marry men of title; and two that died infants.

MONTESQUIEU, Charles de Secondat, Baron de la Brède et de, one of the most celebrated authors and political philosophers of France, b. Jan. 18, 1689, at his father's château of Brède near Bordeaux, and descended from one of the most distinguished families of Guienne. In his youth he was a hard student of jurisprudence, literature, and philosophy. His love of the classical authors was so great that at the age of twenty he composed a work intended to show that they did not deserve eternal damnation for being pagans. In 1714 he was appointed a councilor of the parliament of Bordeaux, and two years after, president of the parliament. His first (published) work was his famous *Lettres Persanes* (Par. 1721), in which, in the character of a Persian, he ridicules, with exquisite humor, and clear, sharp criticism, the religious, political, social, and literary life of his countrymen. Although he did not spare the academy in these *Lettres*, he was admitted a member of it in 1728, and would have been admitted sooner if Cardinal Fleury had not objected on the ground of his jests against religion. In 1726 Montesquieu resigned his office in the parliament of Bordeaux, and spent some years in foreign countries. In England he spent two years, during which he was much in the company of Lord Chesterfield, and was treated with the greatest respect by the most distinguished personages. After his return to Brède, he published his *Considérations sur les Causes de la Grandeur et de la Décadence des Romains* (Par. 1734), a masterly review of Roman history, expressed in a sententious, oracular, and vigorous style. It was followed, after a long interval, by his *Dialogues de Sylla et de Lysimaque* (Par. 1748), published under an assumed name, in which the motives and feelings of a despot are skillfully analyzed. In the same year appeared his great work, on which he had been engaged for twenty years, the *Esprit des Lois* (2 vols., Geneva, 1748), in which it was attempted to exhibit the relation between the laws of different countries and their local and social circumstances. It was immensely popular. No fewer than twenty-two editions were published in eighteen months, and it was translated into various European languages. The *Esprit des Lois* is a wonderfully good book, considering the age in which it appeared. Without adopting Voltaire's hyper-eulogistic criticism, that "when the human race had lost their charters, Montesquieu rediscovered and restored them," it may be said that it was the first work in which the questions of civil liberty were ever treated in an enlightened and systematic manner, and to Montesquieu, more than to any other man, is it owing that the science of politics has become a favorite subject of study with the educated public. Montesquieu died at Paris, Feb. 10, 1755. The collective editions of his works are numerous, amongst which may be mentioned the complete and careful ones by Auger (8 vols., Par. 1819), by Destutt de Tracy and Villemain (8 vols., Par. 1827), by Lefebvre (2 vols., Par. 1839), and by Hachette (2 vols., 1865).

MONTEVIDEO, San Felipe de, the capital of the republic of Uruguay, in South America, is situated on the n. shore of the estuary of the Rio de la Plata (which is here 60 m. wide), and 132 m. e. by s. from Buenos Ayres. It stands on a small peninsula, and is surrounded by a wall and fortifications. The houses are mostly of one story, with flat roofs. The only public buildings worthy of notice are the cathedral and the town-hall. The climate is healthy; but as there are no rivers near the town, water is scarce, and it is only obtainable from wells, or by collecting rain-water in cisterns. The bay or harbor, which is about 3½ m. long by 2 broad, presents excellent facilities for building wharfs, docks, etc., is sheltered from all but the s.w. gales, and averages 16 or 17 ft. in depth. The trade of Montevideo is extensive; the exports consisting of wool, hides, hair, tallow, salt and dried beef, bones, etc.; and the imports, of cotton and woolen fabrics, hardware, also flour, wine, spirits, and other provisions. The chief trade is with Great Britain. Montevideo has steam communication with the United States, Rio Janeiro, Britain, and Genoa, and besides these, carries on a considerable trade with France, Spain, La Plata, and Italy. The population in 1862 (inclusive of the small suburbs of Cordon and Aguada) was 45,765; and in 1872, 105,296. In 1871, 1502 vessels, of 739,607 tons, entered and cleared from the port. The imports for 1872 amounted to about £3,300,000; and the exports to about £3,000,000. For the history of Montevideo, see URUGUAY.

MONTEZ, LOLA. See LOLA MONTEZ.

MONTEZUMA, the name of two of the emperors of Mexico.—Montezuma I., the most able of the Mexican emperors, ascended the throne about 1437, and soon after commenced a war with the neighboring monarch of Chalco, which resulted in the annexation of that kingdom to Mexico. Tlatelolco, Cuihixcas, and Tzompahuacan were next annexed. Some reverses which his arms now suffered led to a confederacy of the Tlascalans and two other powerful tribes against him; but in the war which followed Montezuma's arms were again signally triumphant, and the territories of the conquered tribes increased the domain of the now all-powerful Montezuma. After several other successful wars, he died in 1471.—Montezuma II., the last of the Mexican emperors, before its subjugation by the Spaniards, succeeded to the throne in 1502. He had distinguished himself as a warrior during the reign of his predecessor, and after his accession, carried the terror of his arms to the frontiers of Nicaragua and Honduras. He was at the same time a member of the priestly order, and did not demit his functions on his accession. He devoted his chief attention to the improvement of the laws, and of the internal administration, and displayed his taste for pomp and luxury by the magnificence of his household arrangements, and a profuse embellishment of his capital. This necessitated heavy taxation, which, combined with the strictness of his administration, led to continual revolts among his subjects, especially those who had lately come under his sway. When Cortes landed in Mexico with his small army in 1519, Montezuma, blinded by an old prophecy, and by the strange appearance of the invaders, acknowledged them as beings of a superior order, and as his masters (see CORTES). The inhabitants of Mexico having risen against Cortes, the latter caused Montezuma, who was then his prisoner, to appear in order to pacify them; but being wounded accidentally by a stone flung from amongst the crowd of his own subjects, he so keenly felt the indignities which he had suffered, that he repeatedly tore the dressing from his wound, and soon after died, June 30, 1520. Some of his children adopted the Christian religion, and his eldest son received from Charles V. the title of count of Montezuma. One of his descendants was viceroy of Mexico from 1697 to 1701. His last descendant, Don Marsilio de Teruel, count of Montezuma, was banished from Spain by Ferdinand VII., and afterwards from Mexico on account of his liberal opinions, and died at New Orleans in 1836.

MONTFAUÇON, BERNARD DE, 1655–1741; b. Languedoc, of noble family. Educated for a military life, but ill suited to it, he joined the Benedictine order in 1676, studied till 1687, and was then called to Paris, where his profound knowledge of Hebrew and Chaldaic brought him an appointment to study the libraries of France and Italy in the interest of church history. In Italy he found trouble with the Jesuits, and asked his own recall, on the ground that it was useless "to follow up a dogmatic controversy with such great liars as the Jesuits." His numerous works are mostly in Latin.

MONTFERRAT', formerly an independent duchy of Italy, between Piedmont, Milan, and Genoa, now forming part of the kingdom of Italy. It consisted of two separate portions, Casale and Acqui, lying between the maritime Alps and the Po, and having an area of over 1300 sq. miles. The capital was Casale. Montferrat, after the downfall of the Frankish empire, was ruled by its own margraves till the beginning of the 14th century. This illustrious house for a long time disputed the sovereignty of Piedmont with the house of Savoy, and sent to the crusades more heroes than any other sovereign house in Europe. Members of the family ruled simultaneously in Montferrat, Thessaly, and Jerusalem. On the death of the marquis John I., in 1305, his sister, Iolande or Irene, who was empress of Constantinople, succeeded to Montferrat; and her second son became the founder of the family of Montferrat-Palæologus, which became extinct in 1533, and Montferrat passed to the Gonzagas of Mantua. In 1631 the dukes of Savoy obtained possession of a portion of Montferrat, and in 1703, with the consent of the German emperor, the remaining portion passed under their sway, and was incorporated with their own dominions.

MONTFORT, the name of a noble French house, descended, according to the most probable opinion, from Baldwin, count of Flanders, and Judith, daughter of Charles the bald. AMAURI 2d, seigneur de Montfort (a little town between Paris and Chartres) is the first of the family mentioned in history. He lived in the first half of the 11th century. His son, SIMON 1st, had for his third wife Agnes, daughter of Richard comte de Evreux. He left four sons, of whom only AMAURI 4th had issue. The grandson of this Amauri, SIMON 3d, surnamed the *Bald*, comte de Montfort and Evreux, married Amicie, daughter of Robert de Beaumont, earl of Leicester. His second son was the famous SIMON 4th, comte de Montfort, and earl of Leicester, subsequently comte de Toulouse. This nobleman, so conspicuous in the terrible crusade against the Albigenses (q.v.), was born about the year 1150. In 1198 he went to Palestine at the head of a troop of French knights, but failed in doing anything against the Saracens, and was obliged to return. In 1202 he joined the 4th crusade, which, however, had no religious design at all (see CRUSADES), in consequence of which Montfort abandoned it. In 1209 he took part in the war of extermination against the Albigenses. He signalized himself by his relentless ferocity, and his brilliant successes, but was killed by a stone at the siege of Toulouse, June 25, 1218.

MONTFORT, SIMON DE, Earl of Leicester, the fourth son of the preceding, was b. in France about 1206. The title of earl of Leicester came to him by his grandmother, Amicie de Beaumont, sister and heiress of Robert earl of Leicester, but he did not directly or immediately inherit it; for, during the reign of king John, it was borne by Ranulf, earl of Chester. Some time after the death of Ranulf, Montfort came to England, and offered his services to Henry III. Already he enjoyed a great reputation as a warrior, and Henry was so highly pleased with the young French noble that he conferred on him the title of earl of Leicester. Little did Henry think that the stranger was to prove against himself a great founder and champion of English constitutional liberty. He married Elinor, sister to king Henry III., and the youthful widow of that earl of Pembroke to whom, more than to any other, the people of England owe magna charta. After this marriage—which was viewed with disfavor by the king—de Montfort became a steadfast advocate of the English charter, and of the liberties of the people. After visiting the east, he was sent by the king to undertake the command of Gascony. In 1257 the king's debts were so great and the rapacity of his foreign relations so unbearable, that the people were in a state of insurrection. The barons assembled, and, under the direction of De Montfort, held the celebrated parliament at Oxford. They passed statutes to enforce the provisions of magna charta. The king swore to observe them, but sent forthwith to the pope praying to be absolved from his oath. The bull of absolution arrived. Henry set his barons at defiance, shut himself up in the Tower, and appealed to Louis of France. England was now in arms. The whole middle class looked up to De Montfort as their champion and leader, and the war began with the battle of Northampton. The wars of the barons, under De Montfort, have been superficially viewed but as the strife of turbulent nobles, who, in the absence of foreign warfare, employed themselves in getting up a contest at home. Later researches, however, have shown that but for the struggles of De Montfort and the barons, the concessions at Runnymede would have been a mere worthless parchment. At Lewes the royal forces were signally discomfited and the king taken captive. A French chronicler, who praises De Montfort as "noble, chivalrous, and the ablest man of the age," expressly adds that he was "backed by the general favor of the people," who at this time were so "unspeakably trampled under foot and deprived of all their liberties." The conditions exacted from the king were, that he should observe magna charta and the charter of the Forests; be moderate in his expenses and grants, until his old debts were paid off, and he was enabled to live on his own property, without oppression of merchants or the poor; and that Englishmen only should be chosen counselors. No new pretensions were introduced, even at this moment of triumph, and the constitutional maxim of respecting the person of the king was carefully upheld. The queen (Elinor of Provence), who was in France, now occupied herself in collecting a large army. To deliberate upon the measures to be adopted at this great crisis, writs were issued to the sheriffs, in 1265, by De Montfort, directing them to return two knights for each county, and two citizens or burgesses for every city and borough; and from this time may be clearly dated the recognition of the commons as an estate of the realm in parliament. Guardians had been appointed by the barons to watch over the execution of magna charta, but fifty years of encroachment on the part of the crown convinced De Montfort that a stronger and more enduring security would be to commit the care of constitutional freedom thenceforth to the people themselves, whose interests the barons thus identified with their own. Mr. Blaauw, who, in his *Barons' War*, presents De Montfort almost for the first time in his true character, adds that "it should be an honest pride to us in after-times that English liberty thus owes its birth to the noblest parentage, confidence in the people." A second war broke out, and this time the popular cause was weakened by defection and treachery. Prince Edward (afterwards Edward I.) encountered the barons at Evesham, with a greatly superior army. When defeat was inevitable, the great leader refused to flee. He "fought stoutly like a giant for the liberties of England," but fell, overwhelmed by numbers. The death of De Montfort filled the whole land with mourning. Like Cromwell, whose career in many respects resembles his own, he was denied a grave by the royalists, his head being sent to Wigmore castle, and his mutilated limbs to different towns; but the people bewailed their dead champion, and the clergy pointed to his glorified spirit in heaven. The influence of De Montfort was felt after his death. No baron was executed for bearing arms against his sovereign, and although the Oxford statutes were formally rescinded, their spirit remained. See *Life*, by M. Creighton (1876); and *Simon de Montfort*, by Pauli, translated by Una M. Goodwin (1876).

MONTGOLFIER, JACQUES ETIENNE and JOSEPH MICHAEL, two brothers, distinguished as the inventors of the first kind of balloons (q.v.). They were the sons of a celebrated paper-manufacturer at Annonay, in the department of Ardèche, and early engaged themselves in the same branch of industry. Etienne, after a few successive experiments with the balloon, repaired to Paris; but though his discovery created a great sensation, and was followed out in practice by many eminent men, he obtained little pecuniary aid in carrying on his experiments, and at length retired to his native town, where he resumed the manufacture of paper and died at Servieres, in 1799.—His elder brother, Joseph, the sharer of his labors and his glory, was a man of much genius and little education; but the two brothers were fitted to supplement each other's deficiencies, and together they made many discoveries, and were both received as members of the French academy. Joseph invented the hydraulic screw, the calorimeter, etc., and in the latter part of his life, filled a post in the department of arts and manufactures. He died at Paris in 1810.

MONTGOMERY, a co. in s.e. Alabama, intersected by the Tallapoosa river, bounded n.w. by the Coosa and Alabama, and drained by many creeks; three railroads pass through it the Western, Mobile and Montgomery, and Montgomery and Eufaula; 900 sq.m.; pop. '80, 52,392—38,948 colored. The surface is rolling or even, and very fertile; Indian corn, cotton, and sweet potatoes are the staples; of cotton the annual product is over 25,000 bales, and it is the largest cotton producing county in the state. The co. seat, Montgomery, is also the capital of the state.

MONTGOMERY, a co. in w. central Arkansas, drained by Ouachita river, Caddo creek, and their many branches; 1140 sq.m.; pop. '80, 5,729—258 colored. The surface is rugged and mountainous; the main ridge is called Crystal mountains, and there are found quantities of rock crystals. The soil is not very fertile; tobacco, wheat, Indian corn, and cotton are the staples. The forests are very extensive; lead and limestone are found in considerable amounts. Co. seat, Montgomery.

MONTGOMERY, a co. in s.e. central Georgia, intersected by the Oconee river, and bounded n.e., s., and s.w. by the Pendleton, Altamaha, and Ocmulgee rivers; 624 sq. m.; pop. '80, 5,381—1871 colored. The surface is level and mostly covered with forests; soil light and sandy; chief products: cotton, wool, sweet potatoes, oats, and Indian corn. Co. seat, Mount Ida, near Montgomery.

MONTGOMERY, a co. in s.w. central Illinois, drained by Shoal creek and its branches; intersected by the Decatur and St. Louis, and Indianapolis and St. Louis railroads; about 700 sq.m.; pop. '80, 28,086—25,438 of American birth. The surface is partly woodland abounding in oak, hickory, etc., and partly prairie; the soil is very fertile and all the cereals are raised in large quantities; bituminous coal is found. Co. seat, Hillsborough.

MONTGOMERY, a co. in w. central Indiana; drained by Sugar creek, a branch of Wabash river, and two or three other creeks; intersected by several railroads having their terminus at Crawfordsville; among which are the Louisville, New Albany and Chicago, and the Indiana, Bloomington and Western; about 500 sq.m.; pop. '80, 27,316—26,587 of American birth. The surface is level or moderately hilly, and is fairly fertile; the staples are wheat, oats, Indian corn, hay, and pork. There is much woodland, the sugar maple abounding. Co. seat, Crawfordsville.

MONTGOMERY, a co. in s.w. Iowa, drained by the sources of the Nodaway and Nishnabatona rivers; intersected by the Burlington and Missouri railroad, and by a branch of the St. Joseph and Council Bluffs; 432 sq.m.; pop. '80, 15,895—13,448 of American birth. Surface rolling and fertile; staples: wheat, Indian corn, hay, and pork. Co. seat, Red Oak.

MONTGOMERY, a co. in s.e. Kansas, drained by the Elk, Fall, and Verdigris rivers; intersected by the Leavenworth, Lawrence and Galveston railroad; 576 sq.m.; pop. '80, 18,217—17,324 of American birth; the number having more than doubled since the census of '70. The surface is mostly prairie, but there is some woodland; wheat, oats, and hay are staples; cattle breeding is extensively carried on. Co. seat, Independence.

MONTGOMERY, a co. in n.e. central Kentucky, drained by branches of Licking river, and intersected by the Lexington and Big Sandy railroad; 185 sq.m.; pop. '80, 10,567—3,566 colored. The surface is broken and hilly, and the soil fairly fertile; wheat, oats, potatoes, hay, butter, and pork are the chief products. Co. seat, Mount Sterling.

MONTGOMERY, a co. in w. Maryland, having the state line of Virginia for its s.w. and s. boundary, the District of Columbia for its s., the Potomac river on the s. and w., and the Patuxent river on the n.e.; 500 sq.m.; pop. '80, 24,759—24,890 of American birth, 9,151 colored. It is drained by Seneca and Rock creeks. It is intersected by the metropolitan branch of the Baltimore and Ohio railroad, and the Chesapeake and Ohio canal is on the s.w. border, following the course of the Potomac. Its surface is hilly; it has forests of pine and hardwood timber, and quarries of stone used for building purposes; other mineral products are gneiss and serpentine. Its soil is fertile along the river banks, producing wheat, rye, corn, oats, potatoes, and dairy products. Live stock is raised to some extent. Co. seat, Rockville.

MONTGOMERY, a co. in n. central Mississippi, drained by the Big Black river, and intersected by the New Orleans, St. Louis and Chicago railroad; about 450 sq.m.; pop. '80. 13,348—6,677 colored. The county was set off from Choctaw and Carroll counties in 1872. The surface is level, and there are large forests, mostly of oak, cypress, and magnolia trees. Cotton is raised in large quantities. Co. seat, Winona.

MONTGOMERY, a co. in e. central Missouri, drained by the Cuivre and Lautre rivers, branches of the Missouri, which bounds it on the s.; intersected by the St. Louis, Kansas City and Northern railroad; about 500 sq.m.; pop. '80, 16,251—15,305 of American birth. The surface is very hilly and for the most part covered by extensive forests. Wheat, corn, oats, and tobacco are raised; limestone, iron, and bituminous coal are found. Co. seat, Danville.

MONTGOMERY, a co. in the eastern part of central New York, on the Erie canal and the New York Central railroad; about 356 sq.m.; pop. '70, 34,457. Most of its land is fertile, producing wheat, Indian corn, and oats. The chief industries are the manufacture of agricultural implements. Co. seat, Fonda.

MONTGOMERY, a co. in s. central North Carolina, drained by the branches of the Yadkin river, which forms its w. boundary, and intersected by the Uharee river and Simmon's Fork; 540 sq.m.; pop. '70, 7,487—7,486 of American birth. The surface is hilly, and mostly covered with pine forests. The bottom land about the creeks is fertile, and produces Indian corn, wheat, oats, and grass. Gold is found, but not in large quantities. Chief town, Troy.

MONTGOMERY, a co. in s.w. Ohio, drained by the Miami river, several of its branches, and Mad river; it is traversed by nine lines of railroad, terminating at Dayton, of which the most important are the Sandusky; Dayton, Hamilton, and Cincinnati; Dayton and Western; Atlantic and Great Western; and Dayton and Xenia; 450 sq.m.; pop. '80, 78,545—66,248 of American birth. The surface is mostly hilly but not rugged, and is covered in part by forests of hard wood; the soil is extremely fertile, producing wheat, Indian corn, oats, hay, and tobacco; of the last, the annual yield is from three and a half to four million pounds. Limestone of several kinds is found, and the Niagara, or bluish variety, is extensively used for building in Cincinnati and elsewhere. The Miami canal extends from Dayton to Cincinnati, and furnishes abundant water power. The principal manufacturing interests are at the county-seat, Dayton (q.v.).

MONTGOMERY, a co. in s.e. Penn., on the Philadelphia and Reading railroad, and the Schuylkill river; 460 sq.m.; pop. '70, 81,612. Its principal products are wheat, rye, and Indian corn; its industries, the manufacture of agricultural implements, carriages, and woolen goods. Co. seat, Norristown.

MONTGOMERY, a co. in n. central Tennessee, adjoining Kentucky; drained by the Red river and the Cumberland, the latter a navigable stream; intersected by the Louisville and Great Southern railroad; about 500 sq.m.; pop. '80, 28,461—18,620 colored. The surface is rolling and hilly, in great part covered by forests of oak, beech, gum, hickory, etc.; the soil is very good, producing in large quantities wheat, oats, corn, sweet potatoes, and tobacco; the annual yield of the last is about 5,000,000 lbs., more than is raised in any other county of the state. Limestone and iron are mined. There are several towns, Clarksville being the county seat.

MONTGOMERY, a co. in s.e. Texas, drained by the San Jacinto river and several creeks, and intersected by the International and Great Northern railroad; 1050 sq.m.; pop. '80, 10,154—5,239 colored. The surface is rolling and generally fertile, though there are some sandy plains; corn, sweet potatoes, and cotton are the chief products. Cattle-raising is carried on extensively. Co. seat, Montgomery.

MONTGOMERY, a co. in s.w. Virginia, drained by the Staunton and New or Kanawha rivers, the last being its w. boundary, and intersected by the Atlantic, Mississippi, and Ohio railroad; 460 sq.m.; pop. '80, 16,693—4,229 colored. The surface is mountainous, the co. being close to the Blue Ridge; there are extensive forests; and in the valleys, wheat, Indian corn, oats, and pork are the staples. Limestone is found. The climate is very healthful and invigorating. Co. seat, Christiansburg.

MONTGOMERY, a city and the capital of Alabama, is on the left bank of the Alabama river, 415 m. above Mobile, at the head of steamboat navigation. The city is very handsomely built, with elegant residences and gardens on a cluster of hills, on one of which is a handsome state-house. It has a law-school, several academies, fourteen churches, five banks, four papers, marble-works, iron-foundries, and is one of the largest cotton-marts in the state. Montgomery is connected with four lines of railway. It became, in 1860, the capital of the confederate states, and continued to be the seat of government until, on the secession of Virginia, it was removed to Richmond. Pop. '70, 10,588.

MONTGOMERY (*ante*), a city in Montgomery co., Ala., the capital of the state, and the co. seat, but inferior in size and population to Mobile; situated on a bluff on the left bank of the Alabama river and about 400 m. by river from Mobile; pop. '70, 10,588—5,183 colored. Montgomery is the terminus of the South and North Alabama railroad and of the Montgomery and Eufaula line, and is also on the Western Alabama railroad. The river is navigable and boats run to and from Mobile at all seasons. The city also does a large business with the surrounding country, which is almost wholly engaged in the raising of cotton, an enormous quantity being sent to Montgomery annually, and all supplies obtained thence. In 1861-62 the place was occupied as a capital by the confederate government; evacuated in 1865 and a great amount of property destroyed, in part by the confederate and in part by the union forces. The city has 3 newspapers issuing daily and weekly editions. 4 banks, and 14 churches; among the public buildings are the state capitol, the co. court-house, a city-hall, masonic temple, étc. Montgomery was founded in 1817, and in 1847 was made the capital in place of Tuscaloosa.

MONTGOMERY, Gabriel, Comte de, a French knight of Scottish extraction, and an officer in the Scottish life-guard of the king of France, was born about 1530. At a tournament given, June 30, 1559, by Henry II. in honor of his daughter's marriage with Philip of Spain, the king insisted upon young Montgomery entering the lists with him. Montgomery reluctantly complied, and the shaft of his broken lance entering the king's visor at the eye, Henry II. was borne insensible from the ground, and so continued for eleven days, when he died. Montgomery, although blameless, left France, and soon after embraced Protestantism in England. On the commencement of the religious wars in 1562, he returned to his native country to support the Protestant cause, and defended Rouen with great bravery. In the third religious war, he was one of the leaders of the Protestants, and gained many advantages over the royalists in Languedoc and Béarn. During the massacre of St. Bartholomew he happened to be at Paris, and owed his escape to the swiftness of his horse, and fled to England. In April, 1573, he appeared off Rochelle with a small fleet, but failed in accomplishing anything, and was obliged to retire. Next year, at the head of a band of Huguenots, he landed in Normandy, and commenced war there; but being compelled at last to surrender the castle of Domfront, he was carried to Paris; and although the gen. to whom he surrendered had assured him of his life, he was beheaded, after long imprisonment, May 27, 1574. Brantome describes him as naturally the most nonchalant and pleasure-loving of men, but that, when once he had mounted his saddle, there was not a more daring or vigilant warrior in all Christendom.

MONTGOMERY, James, a minor British poet, the son of a Moravian preacher, was born at Irvine, Ayrshire, Nov. 4, 1771, and at the age of seven was sent to the Moravian settlement at Fulneck, near Leeds, in order to complete his education for the Moravian pastorate. At Fulneck the course of study seems to have been too severe in its character for the young poet; the imaginative side of his mind was allowed no recognition and it was only by stealth that he read Cowper's poems and *Robinson Crusoe*. Much of his leisure time at school was employed in the composition of verses and of music, in which he took much delight. In 1789 he ran away, and after four years of various employment, became engaged as clerk to Mr. Gales, editor of *The Sheffield Register*, for which he soon began to write political articles. In 1794 he commenced a newspaper of his own, *The Sheffield Iris*, which he continued to edit till 1825, when he retired. During the period of his editorship Montgomery was twice subjected to fine and imprisonment by government. In 1795 he was fined £20, and sentenced to three months' imprisonment, for printing off some copies of a miserable ballad in which government suspected that sedition lurked, and in 1796 he was fined £30, and imprisoned for six months, for giving an account of a Sheffield riot. He received a government pension of £150 in 1835, and he died at his own house in Sheffield, April 30, 1854. His principal works are: *The Wanderer of Switzerland* (1806); *The West Indies* (1809); *The World before the Flood* (1812); and *The Pelican Island, and other Poems* (1827). A collected edition of his minor poems appeared in 1851; and in 1858 his *Original Hymns for Public, Private, and Social Devotion* closed the series of his publications.

His poems are melodious, full of picturesque description, and the gentlest human feeling. The personages introduced in his poems are, however, only shadows, or touched with the faintest color of character. But he claims a well-defined position among the favorite poets of his country by several of his hymns and minor poems, and by his exquisite verses on Home, which commences the third part of *The West Indies*.

MONTGOMERY, John B., 1796–1873, b. N. J.; entered the navy in 1812, and was a midshipman on the *Niagara* in the battle of lake Erie, Sept. 10, 1818. For his gallantry on this occasion congress gave him a sword and a vote of thanks. He was attached to the squadron commanded by Decatur in the war with Algiers, commanded the *Portsmouth* during the Mexican war, in which he seized lower California and blockaded Mazatlan, and was made a capt. in 1853. He commanded the Pacific squadron in 1860, was commodore in 1862, and rear-admiral in 1866. He was last stationed at Sackett's Harbor, N. Y. He was retired in 1869.

MONTGOMERY, Richard, 1736–75, b. in Ireland, son of Thomas Montgomery, member of parliament for Lifford: educated at Trinity college, Dublin. In 1754 he obtained a commission in the army, came to America with his regiment three years afterwards, and displayed personal courage and military sagacity at the siege of Louisburg and in other actions. In 1760 gen. Wolfe appointed him adjutant of his own regiment. He took part in the expedition against Havana and Martinique, and shortly after returned to England (1763); resided there for nine years, sold his commission, and again came to America. He settled and married in New York, was a delegate from his county, Dutchess, to the provincial convention of 1775, and soon afterward was commissioned by congress as one of the brig.gens. to command the colonial forces. An invasion of Canada was determined upon and in the same year (1775) Montgomery was made second in command of one of the two divisions sent out under Arnold and Schuyler. The latter was attacked by illness and obliged to return to Albany, leaving Montgomery at the head of the division. He at once pressed forward and though embarrassed by lack of munitions and food, and by the disaffection of some of his command, had before the end of November captured successively Chambly, St. Johns, and Montreal; thus gaining the mastery over the greater part of the province. In the next month a junction was effected with Arnold before Quebec. The assault of the town was at once resolved upon and on Dec. 31, shortly after midnight, attempted, a snow-fall aiding the concealment of the troops' movements. One division was to direct its attack against the fortifications at the lower end of the town, while the other under Montgomery's command was to scale the cape Diamond bastion. The surprise was complete, the British artillerists retreating after one discharge. Unhappily Montgomery, who was pressing forward at the head of his troops, was instantly killed by this single fire, two of his aids falling with him. The undisciplined colonial troops were overwhelmed at the loss of their leader, and a precipitate retreat ensued. There is little doubt that Quebec would have fallen had it not been for the death of the gallant commander. His conduct and character were eulogized in parliament by Burke, Chatham, and even the bitter tory lord North; congress recognized his services by resolutions of respect and veneration; and by its order a monument was erected in his honor in front of St. Paul's church, New York city, where in 1818 his remains were interred with impressive ceremonies. The "Death of Montgomery" is one of Trumbull's masterpieces.

MONTGOMERY, ROBERT, a preacher and verse-maker, who has gained notoriety, if not fame, was born at Bath in 1807. He graduated B.A. at Oxford in 1833, M.A. in 1838, and was ordained in 1835. In 1836 he became minister of Percy street Episcopal chapel, London; he afterward removed to Glasgow, where he preached for four years, but returned to London, and resumed office at Percy street chapel in 1843. He died Dec. 3, 1855. Montgomery's works comprise a large number of volumes in prose and verse, on themes more or less sacred. He is best known by his poems. *The Omnipresence of the Deity* (1828) has passed through 26 editions. But his celebrity may be said to have died with him, and his works have already become part of the lumber of libraries. This result has been brought about to some extent by the judgment which Macaulay passed upon *The Omnipresence* and other works by this author.

MONTGOMERY, Sir ROBERT, LL.D., b. Ireland, 1809; educated at Foyle college, Londonderry, and in 1828 appointed to the service of the East India company. In 1853 he was appointed judicial commissioner, superintendent of prisons, and director-general of police for the province of the Punjaub. For his services in the Indian mutiny, and in quelling the disturbances in the Oude, of which he had been made chief commissioner in 1858, he was thanked by parliament, and knighted. From 1859 to 1865 he was lieut.gov. of the Punjaub. In 1868 he was made a member of the council for India.

MONTGOMERY, WILLIAM READING, 1801-71; b. N. J.; graduated at West Point in 1825, and was appointed to the infantry. He served on the western and Canadian border, and through the Florida and Mexican wars. He was brevetted maj. for gallantry at Palo Alto and Resaca de la Palma. At Molino del Rey he led his regiment after the death of its senior officers, and was dangerously wounded. After further service in Texas and the west he resigned from the army in 1855. On the outbreak of the rebellion he raised a regiment of volunteers from his native state. For his gallantry at Bull Run he was made a brig.gen. He was military governor at various times of Alexandria, Annapolis, and Philadelphia; but resigned his commission, from ill-health, in 1864.

MONTGOMERYSHIRE, an inland co. of n. Wales, between Shropshire on the e., and the Welsh cos., Merioneth and Cardigan, on the west. Area, 483,323 statute acres, of which only about 80,000 are under tillage; pop. '71, 67,623. The surface is almost wholly mountainous, a large portion consisting of bleak elevated moorlands; but toward the English border there are several warm, fertile, and well-wooded valleys. The Severn, the Vyrnwy, and the Dovey are the principal rivers. The county belongs almost entirely to the basin of the Severn. The mineral wealth of Montgomeryshire is not great, but copper, lead, and zinc are procured, and millstones, slates, and limestone are quarried. On the uplands the soil is poor, and suited principally for mountain pasture; but in the valleys grain and flax are raised. Cattle and sheep, and the pure breed of Welsh ponies called "merlins," are reared. The Welsh-flannel manufacture is extensively carried on in the county. The capital is Montgomery; pop. '71, 1285, from which the county received its name, and which was so called from Roger de Montgomery, earl of Arundel and Shrewsbury, who in 1093 recaptured the town and castle, which had been wrested during the previous year by the Welsh from the founder, Baldwin, lieut. of the Marches to William the conqueror and William Rufus. The county sends one member to the house of commons. The county business is carried on at Welshpool and Newtown alternately. There is an excellent trade in cattle and horses. Offa's dike traverses the s.e. corner.

MONTH, originally the period of the moon's revolution round the earth. If this is reckoned from the position of the moon among the stars to her return to the same position, the period is called a *sidereal* month, and consists of 27 days, 7 hours, 43 minutes, 11½ seconds; but if from new moon to new moon, it is longer, being 29 days, 12 hours, 44 minutes, 3 seconds; this is called a *synodic* month (see MOON). The latter period forms one of the three natural measures of the lapse of time, and, notwithstanding that its efficiency depends on the state of the atmosphere, it ranks next to the day in importance. There are several other periods used by astronomers to which this name is applied, as the *tropical* or *periodic* month (27 days, 7 hours, 48 minutes, 4.7 seconds), reckoned from the moon's passing the equinox till her return to the same point; the *nodal* month (27 days, 5 hours, 5 minutes, 29 seconds), from ascending node to ascending node; the *anomalistic* month (27 days, 13 hours, 18 minutes, 37 seconds), from perigee to perigee; and the *solar* month, which is the twelfth part of a solar year, consisting of 30 days, 10 hours, 29 minutes, and 4 seconds. Distinct from all these is the *civil* or *calendar* month, fixed by law for ordinary purposes, and consisting of a fixed number of days—from 28 to 31—according to the particular month. The calendar months, with the number of days belonging to each, are as follow:

	Days.		Days.
1. January	31	7. July	31
2. February	28	8. August	31
" (leap years)	29	9. September	30
3. March	31	10. October	31
4. April	30	11. November	30
5. May	31	12. December	31
6. June	30		

See also the separate months under their own heads. The names by which the months are designated throughout Christendom were given them by the Romans; and though Charlemagne in the 9th c., and the French directory in the end of last century, attempted to substitute descriptive epithets, the old-established names continue to be preferred.

MONTHOLON, Charles Tristan de, *Comte*, afterwards *Marquis de*, descended from an ancient French family, was b. at Paris, 1782. At the age of ten he entered the navy, but exchanged it for the army in 1798. His rise was rapid. He displayed great zeal on behalf of the first consul in the revolution of 18th Brumaire, in the capacity of *chef d'escadron.* He served in a number of campaigns, and was severely wounded at Wagram. Napoleon made him his chamberlain in 1809. He was made a gen. of brigade in 1814, and appointed to the chief command in the department of Loire. On Napoleon's abdication, Montholon remained in France, but held aloof from the Bourbons. No sooner had the emperor escaped from Elba and landed at Frejus, than Montholen hastened to join him. He was present at Waterloo, and accompanied Napoleon to St. Helena, continuing his devoted attentions to him till he breathed his last, and being named in his will as one of his trustees, spared no exertion to carry its provisions into effect. Along with gen. Gourgaud he published *Mémoires pour servir à l'Histoire de France sous Napoléon, écrits à Ste.-Hélène sous sa dictée* (8 vols., Par. 1823). He afterwards published a work entitled *Récito de la Captivité de Ste.-Hélène* (Lond. 1847). In the proclamations which Louis Napoleon issued on his landing at Boulogne in 1840, Montholon was named chief of his staff, and on this account he was condemned by the chamber of peers to 20 years' imprisonment; but he was afterwards pardoned. He died Aug. 21, 1853.

MONTH'S MIND is the name of a Roman Catholic office for the dead, continued through the period of a month, or repeated at the end of that period; the word *mind* being used in the sense of *remembrance*, which it has not infrequently in the common version of the Scriptures and other old English writings.

MONTHYON. See Montyon.

MONTI, Vincenzo, the great regenerator of modern Italian poetry, was b. Feb. 19, 1753, in the Roman province of Ferrara, and studied in the university of Ferrara. On the termination of his studies he repaired to Rome (1778), where the patronage of friends obtained for him the post of secretary to the pope's nephew. During his abode in Rome he became involved in a bitter squabble with Alfieri, whose fame as a master-tragedian of Italy was then high in the ascendant—a fact which may have been unpalatable to Monti in consequence of the failure of his own dramatic attempts. The assassination of Basville, the republican envoy of France, afforded to Monti a subject for his poem, *La Basvilliana.* His two succeeding poems, the *Musigonia* and the *Feroniade*, contained the bitterest invectives against France and Bonaparte; but on the appearance of a French army before Rome, Monti, with the inexcusable inconsistency which characterized his political conduct throughout, hastened to espouse the cause of France, and to invoke the protection of Bonaparte. Monti was shortly after appointed secretary of the Cisalpine directory; and in 1789 repaired to France, where he undertook the translation of Voltaire's poetical works. On returning to Italy he was appointed professor in the university of Pavia; and in 1805, on Bonaparte being proclaimed king of Italy, Monti was appointed state historiographer. On the fall of the empire Monti became the eulogist of the Austrian possessors of his country. In the midst of all these political vicissitudes, he pursued with vigor his studies of the classics, and accomplished one of his greatest works, the translation of the *Iliad* into Italian verse. Monti died at Milan, Oct. 13, 1828, of an apoplectic stroke, and was sincerely lamented, notwithstanding the many opponents his hasty susceptibility had created in life. The best editions of his works are those of Milan (1825–27, 8 vols.), and his *Opere Inedite e Rare* (Milan, 1832–33, 5 vols.). Monti had a warm admiration of Dante, and partook, in some degree, of the spirit of the great master. His chief works are distinguished by sustained grandeur of imagery and diction, by daring flights of imagination, and by the delicacy, elevation, and fire of the sentiments expressed. They are too numerous for separate notice, but the best of them rank among the noblest productions of Italian genius.

MONTICELLO, the residence and estate of Thomas Jefferson, in Albemarle co., Va., three miles west of Charlottesville. The mansion, now in a dilapidated condition, stands on the top of a high hill overlooking a large extent of the neighboring country; and, at the time of its completion, about 1774, was one of the finest and most picturesque residences in the south, surrounded by beautiful lawns, groves, and gardens. It was Jefferson's home during sixty years; but shortly after his death his heirs were obliged to part with it.

MONTIL'LA, a t. of Spain, in the modern province of Cordova, and 20 m. s.s.e. of the city of that name. It stands on a hillside rising from the south bank of a tributary of the Xenil. Manufactures of coarse linen and earthenware are carried on, and oil-mills are in operation. A famous wine is grown in the vicinity. Montilla is the birthplace of Gonzalo de Cordova, the "great capatain." Pop. 15,000.

MONTJOIE ST. DENIS, the war-cry of the old kings of France, said to be as ancient as the days of Clovis, and from which the king-of-arms, Montjoie, who had exclusive jurisdiction in France, derived his title.

MONTLUÇON, a t. of France, department of Allier, is picturesquely situated on a hill on the right bank of the Cher, 40 m. w.s.w. of Moulins. It has some coarse cloth manufactures, and trade in corn, wine, and fruits. It has also iron-works and plate-glass manufactories. Pop. '76, 21,904. At a distance of 10 m. are the wells of Néris-les-Bains, celebrated in the time of the Romans—of whom many traces are left—and still much frequented by invalids.

MONTMAGNY, a co. in e. Quebec, having for its n. and n.w. boundary the St. Lawrence river at its widest portion, Goose island lying directly n., and the Grand Trunk railroad traversing the n. section on the s. bank of the river; about 623 sq.m.; pop. '71, 13,555. It is bounded on the s.e. by the state line of Maine, and drained by the n.w. branch of the St. John's river in the s. section, flowing s. along the s. base of a range of mountains, and is drained also by the Riviere du Sud in the north. Its surface is hilly, furnishing good pasturage, and its soil is fertile. Forests of hard wood supply building timber, and it has saw and grist mills. Co. seat, Montmagny or St. Thomas.

MONTMARTRE. See PARIS.

MONTMÉDY, FORTRESS OF. The t. of Montmédy, in France, is picturesquely located on the river Chiers; pop. about 2,000. It has commerce in grain and wine, and there are manufactures of cheap leathers. It was in the line of the German invasion of France in 1870, and, being a fortified place, was defended with 8 rifled cannon and 65 pieces in battery, and contained a vast supply of munitions of war. It resisted the bombardment of the Germans in September, but succumbed to another attack Dec. 14.

MONTMORENCY, a co. in n.e. Michigan, drained by Black river and Thunder Bay river; 576 sq.m.; population not given in any census returns; unorganized in '80. Its surface consists of table-lands, with a sterile soil. It is extensively covered with forests, and contains beds of iron ore.

MONTMORENCY, a co. in the e. of the province of Quebec, Canada; n.w. of the St. Lawrence; intersected by the St. Anne and Montmorency railroads; 2,183 sq.m.; pop. '70, 12,085—11,602 of French descent. Co. seat, Château Richer.

MONTMORENCY, ANNE, first Duc de, Marshal and Constable of France, b. Mar. 1493, belonged to one of the oldest and greatest of the noble families of France. He received, it is said, the name of *Anne* from his godmother, Anne of Brittany. He distinguished himself by his gallantry and military skill in the wars between Francis I. and the emperor Charles V., and was taken prisoner along with his sovereign in the battle of Pavia, which was fought against his advice. He afterwards became the leader of the French government, showing great ability in matters of finance and diplomacy, and was made constable in 1538; but his rough manners made him an object of dislike to many; and the suspicions of the king having been aroused against him, he was suddenly banished from court in 1541, and passed ten years on his estates, till the accession of Henry II., when he came again to the head of affairs. In 1557 he commanded the French army which suffered the terrible defeat of St. Quentin, in which he was taken prisoner. During the minority of Charles IX., Montmorency, with the duke of Guise and the marshal St. André, composed the famous triumvirate which resisted Catharine de' Medici. In 1562 and 1567 he commanded the royal army against the Huguenots, and in both wars gained victories over them, but received a fatal wound at St. Denis, and died at Paris on the following day, Nov. 12, 1567.

MONTMORENCY, HENRI, second Duc de, grandson of the famous constable de Montmorency, b. at Chantilly, April 30, 1595. His godfather was the great *Henri Quatre*, who always called him his "son." When he was 17 years of age Louis XIII. made him admiral, and he defeated the Huguenots in Languedoc, and took the isle of Ré from those of Rochelle. He afterwards gained other victories over them, and in 1630 received the chief command of the French troops in Piedmont, where he defeated the Spaniards, for which he received a marshal's baton. Unhappily for himself he ventured to oppose Richelieu, who had always been his enemy, and espoused the cause of Gaston, duke of Orleans; for this he was declared guilty of high treason, and marshal Schomberg being sent against him, defeated him at Castelnaudary, and took him prisoner. Montmorency, although almost mortally wounded, was carried to Toulouse, sentenced to death by the parliament, and notwithstanding his expressions of penitence, and the most powerful intercession made for him—for example, by king Charles I. of England, the pope, the Venetian republic, and the duke of Savoy—was beheaded, Oct. 30, 1632. Montmorency was distinguished for his amiability and the courtesy of his manners, as well as for his valor.

MONTMOREN'CY, or MONTMOREN'CI, Falls of, on the Montmorency river, near its mouth, about 8 m. from Quebec, Canada. They are 50 ft. wide and 250 ft. high. They are much visited by tourists. A village of the same name is situated near them.

MONTO'RO, a t. of s. Italy, in the province of Avellino, built partly on the slope and partly around the base of a hill, 12 m. n. of Salerno. Pop. 4,721. It forms the central point of several villages, and has large markets and some linen and cloth manufactures.

MONTORO, a pleasant t. of Spain, in the modern province of Cordova, built on a rocky ridge around which winds the Guadalquiver, 26 m. e.n.e. of Cordova. It contains one the best hospitals in Andalusia. Hardly any drinkable water can be obtained within the town. The heights in the vicinity are clothed with olive plantations, and oil is largely exported from this quarter. Woolens and earthenware are manufactured. Pop. 10,500.

MONTOUR, a co. in e. central Pennsylvania; 150 sq.m.; pop. '70, 15,344—12,824 of American birth. The surface is uneven, and crossed from e. to w. by hills and ridges of a considerable height; one of these, Montour ridge, contains limestone and iron ore, which are found also in other parts of the county; rolled and forged iron is largely exported. The n. branch of the Susquehanna flows through the s., and the rest of the county is watered by Big Roaring, Mahanouring and Chillisquaque creeks. The chief staples are oats, Indian corn, wheat, and potatoes. It is on the Lackawanna and Bloomsburg, and Danville, Hazleton, and Wilkesbarre railroads. Co. seat, Danville.

MONTPE'LIER, the capital of Vermont, is on the Winooski river, 215 m. n.n.w. of Boston. It is a picturesque village, with a handsome state-house, 7 churches, 2 banks, 4 newspapers, iron-foundry, flour-mills, and manufactures of carriages, hats, lumber, etc. Pop. '70, 3,023.

MONTPELIER (*ante*), co. seat of Washington co., Vt.; on the Onion river, 40 m. e.s.e. of Burlington, and 150 m. n.n.w. of Boston; lat. 44° 17′ n., long. 72° 35′ w. It is on the Central Vermont, Montpelier and Wells river, and the Montpelier and White river railroads, and built on a plain surrounded by a hilly country. The state-house, erected in 1857, is of granite, and surmounted by a dome 124 ft. high. It also contains a court-house, 7 churches, banks, insurance companies, 4 weekly newspapers, the state library, and the Vermont Methodist seminary and college for women, besides a number of public and private schools. It is a center of trade for the country, and contains machine-shops, tanneries, foundries, and flour and saw mills. Hats and caps, furniture, and children's carriages are also manufactured. It was made the state capital in 1805.

MONTPELLIER (Lat. *Mons pessulanus* or *puellarum*), a city of France, in the department of Hérault, in 43° 36′ n. lat., and 3° 50′ e. long. Pop. '76, of the town alone, 51,838. Seen from a distance, Montpellier has an imposing appearance, from the number of its towers, steeples, and cupolas; but although its suburbs are clean and well built, the interior of the old town disappoints expectation, being chiefly remarkable for its crooked, dark, narrow, and dirty streets. The public walks, known as those of the Peyrou, and some of the other more elevated points, afford glorious views, embracing the Mediterranean, the Alps, the Cevennes, and the Pyrenees. The most noteworthy buildings are the cathedral, the theater, the exchange, the hall of justice, the prefecture, the observatory, and the university. The last, which was founded in 1196, is composed of three faculties—that of medicine, founded in the 12th c. by Arabian physicians, and still ranking among the best in Europe—that of the exact, and that of the physical sciences. Montpellier has a botanical garden, the oldest in Europe; a public library of 50,000 volumes, and a pharmaceutical school; admirable museums, natural history and fine art collections, etc. The industrial products of Montpellier are pigments and other chemical preparations, brandy, liqueurs, perfumes, soap, corks, sugar, cotton, woolen, and fine leather goods; and the trade, which is very important, includes, besides these articles, wine, seeds, olive-oil, and fruits. Railways to Marseilles, Cette, and other ports, besides various canals, facilitate commercial and social intercourse, and few cities of the empire hold out greater attractions in regard to intellectual culture than Montpellier. Its geographical position has led to its being selected as a place of residence for consumptive patients; but the extreme clearness and even sharpness of the air in the more elevated parts of the town, the occasional occurrence of the icy wind known as the *mistral*, and the sudden accession of overpowering heats, would seem very materially to counteract some of its long reputed advantages.

MONTPENSIER, Anne Marie Louise d'Orléans, Duchesse de, 1627–93; niece of Louis XIII. of France, known as *grande mademoiselle;* one of the richest princesses of her time, ambitious, and beautiful. Though 11 years older than the dauphin, afterward Louis XIV., she sought to marry him, but failed. Charles II. of England when driven from his throne was a refused suitor for her in marriage. In 1649 she placed herself with Condé at the head of the rebellion of the Fronde, and meeting with some transient success endeavored to make it the basis of claims on the hand of Louis XIV. Condé found in her wealth and resolution his most powerful auxiliary. Jointly they were at one time in possession of Paris, installed in the Hotel de ville, while Louis XIV. was obliged to fight for possession of the capital. While the battle was going on, July 2, 1652, in the faubourg St. Antoine between the troops of Condé and those of the king, the former was saved from defeat by Mlle. Montpensier, who ordered the guns of the Bastille to be turned against the king's troops, and with her own hand fired the first gun. In the excesses against the royalists which followed Condé's success in Paris, Mademoiselle was conspicuous for her humane efforts to put a stop to cruelties. On the re-entry of Louis XIV. into Paris, she retired to her estates for five years and dictated *Mémoires*. In 1657, at the age of 30, she was permitted to return to court, where she soon became ridiculous by falling in love with a young cadet named Lauzun, who was put in the Bastille by Louis XIV. on account of his dangerous blandishments. At the age of 42 Mademoiselle offered her hand and heart to the same youth, the king consenting to the marriage; but the consent was withdrawn before the ceremony could take place; Lauzun was sent away and afterward placed in the Bastile for ten years. It is supposed, however, that they had been secretly married, and that this was the pretext on which the king exercised his authority for their separation. When Mademoiselle was 52 years old the marriage was consummated, but Lauzun was then become a miserable wreck of former beauty, and the match was altogether unhappy. It is said that Lauzun's release from prison was bought by Montpensier by the settling of large estates on bastard sons of Louis XIV. by Mme. de Montespan. The brutality of Lauzun soon necessitated a separation, and she subsequently devoted herself to religious exercises. The *Mémoires* were published in Amsterdam in 1786 in 8 volumes. A Paris edition of these and other works from her pen was published by *Chéruel* in 1858.

MONTPENSIER, Antoine Marie Philippe Louis d'Orléans, Duc de, b. France 1824, fifth son of Louis Philippe. He was educated at the college of Henry IV., and went to Africa in 1844 as lieut. in the artillery, receiving a wound in the Ziban campaign. After a tour in the east he married, in 1846, the infanta Marie Louise de Bourbon, sister of queen Isabella II. The marriage created great excitement, Louis Philippe being generally credited with an intention to seat his son upon the throne of Spain. During the revolution of 1848, the duke resided in England, but soon returned to Spain, taking up his residence at Seville. In 1859, he was appointed capt.gen. of the Spanish army. During the political agitation, before the flight of Isabella, the duke quitted Spain at the request of the ministry, at the same time resigning his position in the army, and the title of infante. Returning to Spain, under the provisional government, he offered himself as a candidate for the throne, but destroyed his chances for election by a duel with his cousin, the infante don Enrique de Bourbon, whom he killed March 12, 1870. He was court-martialed and sentenced to one month's banishment from the capital. His eldest daughter, Marie, was married to the comte de Paris, in 1848; and his third daughter, Maria de las Mercedes, married her cousin, Alfonso XII., in 1878, and died June 26, of the same year.

MONTRAILLÉ, a co. in n.w. Dakota, n.e, of the Missouri river, next to British America. The Rivière des Lacs, and White Earth river flow through it. It has only lately been set off.

MONTREAL, the large and fertile island on which the city of the same name is built, is 30 m. long, 10 m. at its greatest breadth, and contains 197 sq. miles. Formed by the separation of the two channels by which the Ottawa issues into the St. Lawrence, its surface, except at Mount Royal, is only diversified by gentle undulations, which run from n.e. to s.w., and are named *Coteaux*. The island forms a co., divided into two ridings, the east, or *Hochelaga*, and the west, or *Jacques Cartier*, each of which returns a member to the provincial parliament.

MONTREAL, the largest city of Lower Canada and of British America, lies in lat. 45° 31′ n., long, 73° 35′ w., on the left bank of the St. Lawrence, 180 m. above Quebec, and 200 below Lake Ontario, 400 from New York, and 2,750 from Liverpool. Its eastern suburb, which is now an incorporated village, called Hochelaga, was originally the site of an Indian village of the same name, discovered in September, 1535, by Jacques Cartier; and it is from his admiring exclamation at the view obtained from the neighboring hill, that Montreal (corrupted from Mont Royal) derives its name. The westernmost permanent settlement which the French obtained in Canada, it was, under them, merely an outpost of Quebec, and continued to be such, under British rule, till 1832, when it became a separate port. Since then, the rapidity of its progress has been astonishing. By the deepening of the shallower parts of the river above Quebec, Montreal is now accessible to vessels of over 8,000 tons burden, and drawing from 19 to 22 feet. Its harbor, lined with wharfs for a mile and a quarter, at which 125 ships could lie at one time, is, from its inland position (90 m. above the influence of the tides), perfectly safe. Situated at the head of the ocean-navigation of the St. Lawrence, Montreal has naturally become the dépôt for the exports and imports of all the Canadas. At the same time, the obstruction to vessels sailing further up the river, caused by the rapids, has been surmounted by magnificent canals. The canals connecting Montreal with Lake Ontario have locks of 200 ft. by 45, with 9 ft. of water on the sills; the locks of the Welland Canal are rather smaller. As Montreal lies also near the confluence of the Ottawa and St. Lawrence, it is in immediate connection with the vast lumber-country adjoining the former river and its tributaries; while a canal has been projected to connect the Ottawa, through lake Nipissing, with the Georgian bay in lake Huron, which, if carried out, will probably bring the produce of the north-western states, as well as of Western Canada, through Montreal, as it would give them an outlet to the ocean between 200 and 300 miles shorter than by the Erie canal. But even at present, while navigation is open, an extensive daily traffic is carried on by steamers and sailing-vessels of every description, with lake Ontario and the Ottawa district, as well as with the lower St. Lawrence; and the ships of the Montreal Ocean Steamship Company, by aid of a subsidy from the Canadian government, keep up a weekly communication with Liverpool, while at the same time the harbor is constantly crowded with vessels from other foreign ports. After the navigation of the St. Lawrence is closed, the ocean-steamers find a harbor at Portland, Maine, which is connected with Montreal by a railway of 292 miles. This line belongs to the Grand Trunk Railway Company, and crosses the St. Lawrence at Montreal, by the celebrated tubular Victoria Bridge, the length of which, including its two abutments and 24 piers, is above a mile and three-quarters, By the lines of the same company, Montreal has railway communication with Upper Canada, the western states, and Lower Canada, while the Intercolonial Railway opens up communication with Halifax and St. John. Several other lines afford direct communication with all the important cities and towns in New York state, and the states of New England. The position, therefore, of Montreal as a center of commerce is perhaps unequaled, and its rapid advance in consequence has placed it, within the last few years, among the first commercial cities of the American continent—second, perhaps, only to New York. Its exports, imports, and duties, collected during the four years previous to 1862, were as follows: 1858—exports, £684,588; imports, £2,450,815; duty collected, £334,768. 1859—exports, £608,952; imports, £3,110,714; duty collected, £467,248. 1860—exports, £1,204,143; imports, £3,066,802; duty collected, £490,770. 1861—exports, £2,083,147; imports, £3,239,515; duty collected, £478,695. For the year ending June 30, 1870, these items had attained the following greatly increased proportions: Exports, £3,979,252; imports, £5,350,169; duty collected, £860,000. In 1873, the value of exports was £4,935,827; of imports, £11,064,129. The value of assessed property in 1873 was £12,712,230; in 1857 it was only £4,609,097. The population has risen in like manner. In 1840, it was about 27,297; in 1852, it was 57,716; in 1854, about 65,000; in 1861, 90,323; and, in 1871, 107,225. The number of sea-going vessels arriving in the port of Montreal in 1873 was 422; in 1856, the number of sea-going vessels was only 232. The harbor is open on an average about eight months, from the latter half of April to the beginning of December.

The most conspicuous building in Montreal, which is, perhaps, also the finest church on the continent of America, is the Roman Catholic cathedral. Built in the Gothic style of the 18th c., it comprises seven chapels and nine aisles, and can accommodate between 6,000 and 7,000 people. It has six towers, of which the three on the main front are 220 ft. in height; and its chief window is 64 ft. high, and 32 broad. There are several other Roman Catholic churches belonging to the order of St. Sulpice, to whose members chiefly Montreal owes its foundation, and who still hold the seigniory of the island on which the city is built. Adjoining the cathedral, is the seminary of St. Sulpice, to which a large addition has been built within the last few years at a cost of £8,000. The city contains also some of the largest conventual establishments in the world. The general wealth, indeed, of the Roman Catholic church in Montreal has grown enormous, in consequence of the increased value of the property given to it during the early settlements of the French. The church of England has recently erected, at an expense of above £20,000, a new cathedral, which is very chaste in style, though somewhat small for a metropolitan see. St. Andrew's church, the most important belonging to the church of Scotland, is also a very chaste specimen of Gothic architecture, and cost about £10,000. At about the same cost, the Methodists have built a handsome church in the florid Gothic style. Besides the Roman Catholic college in College street, St. Mary's college of the Jesuits, and a Baptist college, Montreal possesses an important university under the name of M'Gill College. Founded by a bequest of the Hon. James M'Gill in 1811, erected into a university by royal charter in 1821, and reorganized by an amended charter in 1852, it has now, besides its principal, the distinguished naturalist, Dr. Dawson, a staff of 29 professors, and has an attendance of upward of 300 students. Montreal is supplied with water by magnificent works, which cost about £120,000. The water is brought from the St. Lawrence, above the Lachine Rapids, by an aqueduct five m. long to a pond, from which it is forced up by power derived from part of its surplus waters into reservoirs capable of containing 20 millions of gallons, and situated 200 ft. above the level of the river. Along the side of the "Mountain," there is a line of mansions, which command the view that astonished J. Cartier, and which may compare with the suburban mansions of the wealthiest cities in Europe or America. Montreal returns three members to the provincial parliament.

MONTREUX, a commune in the canton of Vaud, Switzerland, on lake Geneva, s.e. of Lausanne; pop. '70, 4,731. It contains a number of villages, including Clarens, celebrated in connection with J. J. Rousseau, and Montreux a winter resort for invalids. This commune is said to be one of the most healthful places in the world.

MONTROSE', a royal and parliamentary burgh and seaport on the n.e. coast of Scotland, in the county of Forfar, and situated at the mouth of the river South Esk, about 80 m. n.e. of Edinburgh, and 40 m. s. of Aberdeen. It stands on a level peninsula between the basin of the Esk (an expanse 7 m. in circumference, and dry at low water) and the mouth of the river. A fine suspension-bridge, 432 ft. long and 26 ft. broad—erected in 1828-29 at a cost of nearly £20,000—connects the town with Rossie island, which is again connected with the mainland by a small draw-bridge. The royal lunatic asylum, opened in 1868 at a cost of upwards of £30,000, accommodates about 400 patients. Between the town and the shore are the "links" or downs, among the finest in Scotland for golfing or cricketing. The harbor affords excellent accommodation to vessels of large tonnage, there being 18 ft. of water on the bar at low-water of spring-tides, and is one of the best on the e. coast. Two lighthouses stand in a line on the n. bank of the river, about 400 yards apart; while a magnificent tower, named the Scurdyness lighthouse, erected by the board of trade in 1870 at a cost of nearly £2,700—exhibiting a clear white light, visible at nearly 20 m. distance—stands at the mouth of the river. Flax-spinning is the chief manufacture in the town, there being 4 factories of about 500 horse-power in the aggregate, employing upwards of 2,000 hands, at a weekly cost of about £1500. There is also a large saw-mill, giving employment to nearly 300 men and boys. Ship and boat building, formerly a staple trade of the town, has greatly fallen off. Education is well represented in the town—the chief institution being the academy. In 1875, 1751 vessels, of 108,778 tons, entered and cleared the port. Imports—coal, lime, slate, iron, flax, and manures; exports—manufactured goods, salmon, herring, dressed wood, and agricultural produce. In 1875, the total value of trade was £404,453. Pop. '71, 15,720. Montrose unites with Arbroath, Brechin, Forfar, and Bervie to send a member to parliament.

MONTROSE, JAMES GRAHAM, first marquis of, belonged to a family that can be traced back to the year 1128. Its first notable member was sir JOHN GRÆME of Dundaff, who fell at the battle of Falkirk, July 22, 1298. Early in the 15th c., sir WILLIAM GRAHAM married for his second wife a daughter of Robert III. ROBERT, the eldest son of this marriage, was ancestor of the Grahams of Claverhouse. The third lord Graham, created earl of Montrose by James IV., fell at Flodden; his eldest son at Pinkie. The next in succession became viceroy of Scotland after James VI. had ascended the throne of England. His eldest son, John, who succeeded to the earldom in 1616, married lady Margaret Ruthven, eldest daughter of William, first earl of Gowrie, and sister of the unfortunate nobleman who gives name to the *Gowrie Conspiracy*. The issue of this union was five daughters and one son, James, the "great marquis," who was born in 1612, according to tradition, in the town of Montrose. His mother died in 1618, his father in 1626. In the following year, the boy was sent to the university of St. Andrews by his guardian and brother-in-law, Archibald, lord Napier, son of the famous inventor of logarithms. He was an apt, if not an ardent student, and during the two or three sessions of his attendance at college, acquired a very respectable amount of classical knowledge, besides exhibiting a genuine predilection for literature, which the stormy character of his after-life never quite destroyed. In his 17th year, he married Magdalene Carnegie, daughter of lord Carnegie of Kinnaird, on which occasion he had his portrait painted by Jameson, the pupil of Van Dyck. For the next three years he lived quietly at Kinnaird castle, pursuing his studies. On attaining his majority, he left Scotland, to travel on the continent, visited the academies of France and Italy, and perfected himself in all the accomplishments becoming a gentleman and a soldier. On his return, he was introduced to king Charles I., but owing, it is said, to the machinations of the marquis of Hamilton, was coldly received by that monarch, and had no sooner reached Scotland, than he joined the ranks of the king's opponents, which at this period comprehended the majority of Scotchmen. Montrose came back in the very year (1637) when the tumults broke out in Edinburgh on the attempt to introduce the prayer-book. Whether his conduct at this moment was the result of chagrin, or whether he was carried away by the prevailing enthusiasm, or by the persuasions of craftier persons than himself, is difficult to say. Baillie speaks of his having been "brought in" by "the *canniness* of Rothes," a phrase which appears to Mr. Mark Napier to indicate that he was trepanned with difficulty into joining the league. At any rate, the youthful nobleman soon became to appearance one of the most zealous of the covenanting lords. He was one of the four noblemen selected to compose the "table" of the nobility, which, along with the other tables of the gentry, of the burghs, and of the ministers, drew up the famous national covenant (see COVENANTS), sworn to by all ranks at Edinburgh in the spring of 1638. Montrose was appointed in the following summer to agitate for subscriptions in Aberdeenshire, where the influence of the marquis of Huntly was exercised on the side of the king. He did not, however, meet with great success. In 1639, he made three military expeditions to Aberdeenshire to overawe the royalists. The latter were in considerable force under the marquis of Huntly, but owing to the timid, if not treacherous orders of the marquis of Hamilton, then governor of Scotland, they were always forced to disband. Montrose twice took the city of Aberdeen. On the first occasion (March 29), he compelled the inhabitants to subscribe the covenant, but did no injury to the city. His "too great" humanity is even lamented by Baillie. On the second (May 25), he imposed on the city a fine of 10,000 merks; but though his soldiers pillaged the place, he honorably resisted the importunities of the zealots among the Presbyterian clergy, who wished to expose it to the horrors of conflagration. Baillie again complains of his "too great lenity in sparing the enemy's houses." The arrival at Aberdeen by sea of the earl of Aboyne—Charles's lieutenant of the north—with some re-enforcements, induced Montrose to retreat, who was followed by the earl and the Gordon Highlanders. At Meagra Hill, near Stonehaven, a battle was fought (June 15) between the two armies, in which Montrose obtained a complete victory; four days later, he was again master of Aberdeen, after a fierce struggle at the passage of the Dee. The citizens were stricken with alarm, expecting some bloody punishment for their well-known Episcopalian leanings, but Montrose agreeably disappointed their fears. At a subsequent period, he was upbraided by the committee of estates for not having burned the town on this occasion. News of "the pacification of Berwick" now arrived in Aberdeen, and terminated the struggle in the north. Charles invited several of the covenanting nobles to meet him at Berwick, where he was then holding his court, and to consult with him about Scottish affairs. Among those who went was Montrose, and the Presbyterians dated what they regarded as his apostasy from that interview. Be that as it may, his political position was certainly different after his return. In the general assembly which met, Aug. 13, 1639, under the presidency of the earl of Traquair, as royal commissioner, he showed symptoms of disaffection towards the covenant, and was the object of much popular obloquy. One night he is said to have found affixed upon his chamber-door a paper bearing these words, *Invictus armis, verbis vincitur*. The dissolution of the parliament, in June 1640, led to an open rupture between the king and the covenanters, and both parties prepared to decide their quarrel by force of arms. The former assembled at York an army of 21,000 horse and foot; the latter another of 26,000, which, under the command of Leslie, crossed the Tweed, Aug. 21, 1640. Montrose was the first man that forded the stream. The successes of the Scots, as is well known, soon forced Charles to summon a new parliament for the settlement of the national grievances. Meanwhile Montrose, along with several other influential nobles, had entered into a secret engagement at Cumbernauld, for the purpose of frustrating what they regarded as the factious designs of the extreme covenanting leaders. His conduct in England, too, had been suspicious. It was accidently discovered that he had been secretly communicating with the king; and when the parliament assembled (Nov., 1640), he was cited to appear before a committee. The affair of the *Cumbernauld bond*, discovered by the ingenuity of Argyle, was brought up; but Montrose defended his conduct and that of his colleagues; and nothing came of it, though some fiery spirits among the clergy, says Guthrie, "pressed that their lives might go for it." In the following June, Montrose and some others were accused of plotting against Argyle, and were confined in Edinburgh Castle, where they remained till the beginning of 1642, when they were set at liberty in return for the concessions which Charles had made his Scottish subjects. Although they had been frequently examined, nothing definite had been proved against them. The accusation that Montrose had offered to the king to assassinate Argyle, is not historically substantiated, and is intrinsically improbable. During the next two or three years, he kept aloof, outwardly, from public affairs, but he had finally broken with the covenanters, and had privately ranged himself on the side of the king. The civil war in England had now broken out, and was being carried on with dubious success. Charles and his advisers resolved to crush the Presbyterian leaders in Scotland, who were abetting the efforts of the English parliamentarians. In the spring of 1644 Montrose now raised to the rank of marquis, left Oxford, where he had been residing with his sovereign, and proceeded to Scotland to raise the royalists in the north. The battle of Marston Moor for a moment paralyzed him, but his resolution speedily returned. He threw himself into the highlands, and after skulking about the hills for some time in disguise, met at Blair-Athol some Irish auxiliaries and a body of Highlanders under Allaster Maccoll Keitache Macdonald, better known as *Colkitto*, who had forced their way thither from the Western Isles in hopes of joining him. Montrose instantly placed himself at their head, and the clans quickly rallied round his standard. Marching south, he fell suddenly (Sept. 1) on the covenanting army commanded by lord Elcho, at Tippermuir, near Perth, and gained a complete victory. Not a single royalist was slain. The same night, Montrose entered Perth, where he remained for three days, levying a fine of 9,000 merks on the inhabitants. He then set out for the north, defeated a force of covenanters under lord Burleigh at Aberdeen (Sept. 13), and took possession of the city, which was abandoned for four days to all the horrors of war. The approach of Argyle, at the head of 4,000 men, compelled Montrose, whose forces were far inferior in numbers and discipline, to retreat. He now plunged into the wilds of Badenoch, recrossed the Grampians, and suddenly appeared in Angus, where he wasted the estates of more than one covenanting nobleman. Having obtained fresh supplies, he once more returned to Aberdeenshire, with the view of raising the Gordons, narrowly escaped defeat at Fyvie in the end of Oct., and again withdrew into the fastnesses of the mountains. Argyle, baffled in all his attempts to capture or crush Montrose, returned to Edinburgh, and threw up his commission.

His opponent, receiving large accessions from the Highland clans, planned a winter campaign, marched south-westward into the country of the Campbells, devastated it frightfully, drove Argyle himself from his castle at Inverary, and then wheeled n.. intending to attack Inverness, where the covenanters were posted in strong force under the earl of Seaforth. The "estates" at Edinburgh were greatly alarmed, and raising a fresh army, placed it under the command of gen. Baillie, a natural son of sir William Baillie of Lamington. After consulting with Argyle, it was arranged that he should proceed by way of Perth, and take Montrose in front, while Argyle should rally his vast array of vassals, and attack him in the rear. The royalist leader was in the great glen of Albin—the basin of the Caledonian canal—on his way to Inverness, when he heard that Argyle was following him. He instantly turned on his pursuer, fell upon him unexpectedly at Inverlochy, Feb. 2, 1645, and utterly routed his forces. Fifteen hundred of the Campbells were slain, and only four of Montrose's men. He then resumed his march northwards, but did not venture to assault Inverness—his wild mountaineers being admirably fitted for rapid irregular warfare, but not for the slow work of beleaguerment. Directing his course to the e., he passed—with fire and sword—through Elgin and Banff into Aberdeenshire, which suffered a similar fate. Baillie, and his lieutenant, Hurry, were at Brechin, but Montrose, by a dexterous movement, eluded them, captured and pillaged the city of Dundee (April 3), and escaped safely into the Grampians. On the 4th of May, he attacked and routed Hurry at Auldearn, near Nairn, and after enjoying a short respite with his fierce veterans in Badenoch, again issued from his wilds, and inflicted a still more disastrous defeat on Baillie himself at Alford, in Aberdeenshire (July 2). There was now nothing to prevent his march s., and about the end of the month, he set out with a force of from 5,000 to 6,000 men. He was followed by Baillie, who picked up re-enforcements on his way, and on the 15th of August again risked a battle at Kilsyth, but was defeated with frightful loss—6,000 of the covenanters being slain. The cause of Charles was for the moment triumphant; Montrose was virtually master of the country. The king formally appointed him lieut.gov. of Scotland, and the commander-in-chief of the royal forces. All the principal cities in the w. hastened to proclaim their fidelity, and laid the blame of the recent troubles on the unfortunate Presbyterian clergy. But affairs soon took a very different turn. Great numbers of the Highlanders returned home—we might even say, deserted—burdened with multifarious plunder; and the earl of Aboyne withdrew with all his cavalry. Montrose's position in a district teeming with enemies, was growing critical, and on the 4th of September he broke up his camp at Bothwell, and marched for the eastern counties, where Charles had informed him that the earls of Traquair, Home, and Roxburgh were ready to join him. In this he was disappointed, and on the 13th of the same month he was surprised at Philiphaugh, near Selkirk, by David Leslie, who fell upon the relics of Montrose's army and his raw levies with 6,000 cavalry—the flower of the Scottish forces then serving in England—who had been hurriedly dispatched home on the news of Montrose's startling successes. Leslie completely annihilated his opponent. "On Philiphaugh," says sir W. Scott, "Montrose lost the fruit of six splendid victories." Escaping from the field of battle, he made his way to Athol, and again endeavored, but in vain, to rouse the Highlands; and at last Charles, now beginning to get the worst of it in the civil war, was induced to order him to withdraw from the kingdom. On the 3d of September, 1646, he sailed for Norway, whence he proceeded to Paris. Here he endeavored, but in vain, to induce Henrietta Maria to bestir herself on behalf of her husband. The queen coldly received all his suggestions, and at last Montrose, in despair, betook himself to Germany, in hope of service under the emperor, but soon after returned to Holland, and entered into communication with the prince of Wales, afterwards Charles II. It was here that news of Charles I.'s execution reached him. Montrose fainted on receipt of the dreadful intelligence, and gave way to the most passionate regrets. Charles II. now re-invested him with the dignity of lieut.gov. of Scotland, and Montrose undertook a fresh invasion, on behalf of the exiled monarch. In March, 1650, he arrived at the Orkneys with a small force, and after the lapse of three weeks, proceeded to Caithness; but neither the gentlemen nor the commons would rise at his call. He forced his way as far s. as the borders of Ross-shire, where his dispirited troops were attacked and cut to pieces at a place called Corbiesdale, near the pass of Invercarron, by a powerful body of cavalry under col. Strachan. Montrose fled to the wilds of Assynt, where he was nearly starved to death, when he fell into the hands of M'Leod of Assynt, who delivered him up to gen. Leslie, by whom he was brought to Edinburgh. Condemned to death as a traitor to the covenant, he was executed, May 21, 1650. His demeanor in his last moments was very noble and dignified.

MONTS, PIERRE DU GUAST, Sieur de, 1560–1612; b. in France of an Italian family, became a Protestant, and a favorite of Henry IV., a protégé in the royal household and governor of French provinces. In 1602 the king made him governor of the French company of Canada, which was given exclusive right to trade in furs between 40° and 50° n. lat., the right to make land grants and govern the country, under the name of Acadia, with the title for himself of vice-admiral and lieut.gen. Taking with him Samuel Champlain, Poutrincourt, Biencourt, and Pontgravé as chief officers, he sailed from Havre, March 7, 1604. He made Poutrincourt governor of Port Royal, explored the bay of Fundy, made Tadoussac in the St. Lawrence his fur trade depot, and returned to France. There he found his monopoly had excited such lively opposition that his privileges had been withdrawn. But he succeeded in recovering a part on more specific conditions and returned to Canada, where Champlain, one of his officers, founded the city of Quebec in 1608, and his fur trade became profitable. After Henry IV. was assassinated Monts's privileges were taken away, to his financial ruin. Charlevoix mentions Monts as a thoroughly honest man, of capacity and straightforwardness, fitted to succeed in any enterprise of a commercial character. He died in Paris.

MONTSERRAT′, one of the lesser Antilles, belonging to Britain, lies 48 m. n.w. of Guadeloupe, and at a similar distance from Antigua and St. Kitts. It is about 11 m. in length, 7 in breadth, and contains an area of 47 Eng. sq. miles. The population in 1871 was 8,693, the females exceeding the males by 737. About two-thirds of the surface is mountainous and barren, the rest is well cultivated. The chief products are sugar, limes, rum, and molasses; but cotton, arrow-root, and tamarinds are also exported. The island forms a portion of the government of the Leeward isles, and is directly ruled by a president, aided by a council and house of assembly. The chief town is Plymouth, on the s. coast. The revenue of Montserrat in 1874 amounted to £4,648, and the expenditure to £5,038. In 1873 the tonnage of vessels which entered and cleared its port was 18,218; and the total values of imports and exports in 1874 were respectively £23,938 and £33,079.

MONTSERRAT (Lat. *Mons Serratus*, so named from having jagged ridges *like the teeth of a saw*), a mountain of Catalonia, in the n.e. of Spain, about 30 m. from Barcelona. Its height is 3,919 feet. "Its outline," says Ford (*Handbook for Spain*, vol. i. p. 419), "is most fantastic, consisting of cones, pyramids, buttresses, nine-pins, sugar-loaves, which are here jumbled by nature in a sportive mood." The pious Catalonians aver that it was thus riven and shattered at the crucifixion. Every rift and gorge is filled with box-trees, ivy, and other evergreens. From the topmost height the eye wanders over all Catalonia, and from the sea the ridge looks like an immense wall with seven pyramidal peaks. The mountain, however, owes its celebrity not to its extraordinary appearance, but to the Benedictine abbey built upon it, at an elevation of 1200 feet, and to the 13 hermitages formerly perched like eagles' nests on almost inaccessible pinnacles. In 1811 the French, under Suchet, plundered the abbey, burned the library, shot the hermits, and hung the monks (who had given shelter to their emigrant brethren at the revolution). The place suffered still more in 1827, when it became the stronghold of the Carlist insurrection.

MONTYON, or **MONTHYON**, ANTOINE JEAN BAPTISTE ROBERT ANGEL, Baron de, (sometimes erroneously named MONTHYON), 1733–1820; b. in Paris. Left in the possession of considerable wealth while young, he soon became distinguished by his noble use of it. An advocate at 23, member of the council of state at 27, at the head of the government of Auvergne at 33, Montyon in every place exhibited benevolence and philanthropy in connection with administrative ability. He dedicated 20,000 livres annually to the help of poor workmen. After serving successively as intendant of Provence and La Rochelle he was called to Paris to be made councilor of state in 1775. Author as well as statesman and philanthropist, he sent to the académie Français in 1777 an *Éloge de Michel de l'Hospital;* in 1778 published *Recherches et Considerations sur la Population de la France.* Often he relieved the wants of writers in distress, who rarely knew the source of their benefactions. In 1780 he founded a large number of prizes in the various societies of France, to be awarded through their officers to meritorious improvements or work in the arts, for the most useful literary works, for the best means of avoiding the unhealthy effects of certain mechanical operations upon the workmen, for the best treatises on mechanical processes, for the noblest acts performed by the poor, and for the most useful medicine. For each of these prizes or sets of prizes he set apart 12,000 livres of which the income should form the annual awards. At the beginning of the revolution, fearing the storm that menaced the rich and noble, he emigrated to Geneva, whence he sent an essay to the French academy, entitled, *Consequences qui ont Résulté pour l'Europe de la Découverte de l'Amerique*, for which he received the prize of 3,000 francs, and presented it to the academy to be used for another prize. He took no part while in Geneva, or afterwards while residing in England, with the intrigues of the royalists. In 1798 he published in London a valuable work entitled *Rapport sur les Principes de la Monarchie Française*, intended as a refutation of a work by Calonne in which that minister asserted that France never had had a legal constitution. Montyon made a masterly showing that while France had not lacked for legal constitutions her kings had always power and will to violate them at pleasure. He remained an exile from his country throughout the directory and the empire of Napoleon I., not so much by his attachment to the old monarchy as his repugnance to the military horrors of imperialism. He returned to Paris in 1814, and after 1815 re-established such of his prizes and beneficences as had been stopped by the revolution and the empire, and not only put them on a new footing but richly endowed new charitable institutions in Paris; and on his death in Paris distributed permanent bequests to a large number of the most beneficent institutions of France. Among his published works of permanent value are: *Quelle Influence ont les diverse Espèces d'Impôts sur la Moralité, l'Activité, et l'Industrie des Peuple;* and, *Particularités et Observations sur les Ministres de Finances les plus Célèbres depuis* 1660 *jusqu' en* 1791, a remarkably interesting compendium of facts, philosophy, and anecdotes.

MONUMENT (Lat. *monumentum*, from *moneo*, to remind), anything durable made or erected to perpetuate the memory of persons or events. The chief kinds of monuments are described under their special names. See CAIRN; CROMLECH; SEPULCHRAL MOUNDS: PILLAR; OBELISK; PYRAMID; ARCH, TRIUMPHAL; BRASSES; TOMB; STUPA; MAUSOLEUM, etc.

MONUMENTAL THEOLOGY designates the scientific study of theological opinion and feeling as unconsciously expressed in works of art. While, in written language, thought is presented by the discursive faculty in elements which are gradually apprehended, a work of art, as a completed object existing in space, may produce at once its grand impression on the mind. But as the Christian church took its rise in the midst of Judaism and of heathen worship, and as its first members had been trained under the influence of one or both of these conflicting systems, Christian monuments as well as early church doctrine and practice often present a mixed character. In the progress of the church it was also frequently attacked by errors within and hostile influences without, the effect of which would be exhibited in its works of art. A complete consideration of monumental theology, would, therefore, require careful attention to these modifying agencies as they show themselves in works of art. The principles of Christianity, from its origin to the present day, have influenced human art as well as thought and life. While this influence has sometimes been disastrously exerted, it has generally been in some degree beneficial. After the revival of classical learning and the infusion of new elements into modern life, art was indeed partly liberated from that subjection to the church which in the middle ages had been complete. Yet it must always find its noblest inspiration in Christian themes. Consequently its monuments may be expected to exhibit much of the Christian thought and feeling of each successive age. Hence recent writers on theological encyclopædia continue the study of Christian monuments to the present time. Piper, the chief advocate of this method of collateral theological study, presents the following classification of its themes: I. Of the essential nature of Christian art—1. Of the art faculty. 2. The artist. 3. Works of art. II. History of Christian art and art-works—1. Chronology and geography of art. 2. The various species of art. 3. Art monuments. III. Christian art ideas—1. In architecture. 2. In the graphic arts. For theological purposes this last is the principal division, and to illustrate it the others are chiefly preliminary. Architecture furnishes to this department much less than painting and sculpture. Biblical subjects are found represented in works of art through all periods of church history. The *Biblia Pauperum*, Bible of the poor, for example, consisted of 40 or 50 pictures giving the events of the life of Christ and some of the Old Testament times; each picture had a Latin text or sentence. A larger work with the text in rhyme was called the *Mirror of Salvation*. Before the reformation these were the chief text-books in use, especially by the monks in their preaching, and were practically all the Bible which the laity and even many of the clergy knew. The pictures were copied in sculptures, in paintings on walls and on glass, and in altar-pieces. And after the invention of printing the *Biblia Pauperum* was perhaps the first book printed in Germany and Holland, first with wooden blocks and then with types. While monumental theology is an interesting and to some extent useful collateral study, its claim to an independent scientific treatment is denied by many eminent authors, and must be regarded, at best, undetermined.

MONZA (anc. *Modœtia*), chief t. of a district in the province of Milan, stands on the river Lambro, 10 m. n.n.e. of Milan, with which it is connected by railway. Pop. '72, 16,000. It is essentially a town of Lombard growth, and under the Lombard sovereigns was capital of their kingdom. It owes much of its early importance, and its chief public edifices, to Theodolinda, the great queen of the Lombard dynasty. In the middle ages, Monza was conspicuous for the wealth of its numerous citizens and nobles, and the extent of its cloth-trade. It has undergone 32 sieges. The cathedral, founded in the 6th c. by Theodolinda, contains many interesting memorials of this great queen. The famous iron crown (q.v.) and regalia of Lombardy, employed at the coronation of the German emperors as kings of Italy, were removed from Lombardy by the Austrians in 1859, on the cession of that province to France. The town has a good gymnasium, a theater, two hospitals, and a philharmonic institution. Its present manufactures of cottons, hats, and preserved meats are daily increasing. Monza is surrounded by an exuberantly fertile district, which yields abundance of grain, fruits, wine, and silk, and possesses great beauty of scenery and climate.

MOODY, a co. in s.e. Dakota, bounded by Missouri, drained by the Big Sioux river and its branches; about 500 sq.m.; pop. '80, 3,915—926 foreign, a very large increase within the last few years. The surface is a rolling prairie and quite fertile, wheat being the chief product. Co. seat, Flandreau.

MOODY, DWIGHT LYMAN, b. Mass., 1837. He worked on a farm until the age of 17, and then became a clerk in a boot and shoe store in Boston. He joined a Congregational church, and in 1856 he went to Chicago, where he engaged in mission work among the poor. He established a Sunday school, which in a year numbered 1000 scholars. During the war of the rebellion he was in the service of the Christian commission, and subsequently a city missionary employed by the Young Men's Christian association of Chicago. A church was built for him, and though unordained, he was chosen its pastor. In the Chicago fire of 1871, the church, mission house, and furniture were destroyed. A new church was erected large enough to accommodate 2,500 persons. In 1873 he visited Europe with Ira D. Sankey, the singer, holding large and successful meetings in Edinburgh, Glasgow, Dublin, London, and other important places. Returning home in 1875, he has held large and interesting meetings in New York and many other large cities. He makes no claim to scholarship or rhetorical graces; but is a close student of the Bible, a most earnest, faithful, and simple preacher, and is recognized as charitable and judicious. Vast crowds have attended his services in England and this country, and many converts have been gathered.

MOODY, JAMES, 1746–1809; b. N. J.; a farmer who commanded a force of tories during the revolutionary war. He was taken prisoner, but escaped from West Point, where he was confined, and went to England. There, in 1783, he published an account of his loyalist campaigns, under the title of *Lieut. James Moody's Narrative of his Exertions and Sufferings in the Cause of Government since* 1776. After the war he removed to Nova Scotia. His *Narrative* was reprinted at New York in 1865.

MOODY, JOSHUA, 1633–97; b. England; in childhood came to Newbury, Mass.; graduated at Harvard college in 1653; began to preach in 1658; became pastor of the church in Portsmouth, N. H., in 1671. He became involved in quarrels with the government of the colony, and was imprisoned, but released on condition of his leaving the colony. In 1684 he was settled in Boston as the assistant minister of the First church; was appointed president of Harvard college, but declined the appointment. During the witchcraft trials in 1692 he opposed the unjust and violent measures against the accused, and aided some to escape from prison. His zeal occasioned his dismissal from the church, and he left the ministry. He published *A Practical Discourse Concerning the Choice Benefit of Communion with God in his House, witnessed unto by the Experience of Saints as the best Improvement of Time, being the sum of Several Sermons on Psalm lxxxiv.* 10, *preached at Boston on Lecture Days; A Sermon on the Sin of Formality in God's Worship, preached on the Weekly Lecture in Boston.*

MOODY, SAMUEL, 1676–1747; b. Mass.; graduated at Harvard college in 1697, was minister at York, Me.; was chaplain to sir William Pepperell's expedition against cape Breton. He was an eccentric but very useful man; some of his odd expressions are still in circulation, showing much shrewdness and a quick wit. He refused a regular salary, depending on the voluntary contributions of the people. He published *The Doleful State of the Damned; Judas hung up in Chains; Election Sermon; Life and Death of Joseph Quasson, an Indian.*

MOO'ERS, BENJAMIN, 1758–1838; b. Mass.; was an ensign in the revolutionary army, and afterward lieut. and adj. He served through the war, at the close of which he settled in Plattsburg, N. Y. He was for a number of years a member of the legislature of that state, besides holding various local offices, and he was a maj.gen. of militia, and commanded at the battle of Plattsburg, Sept. 11, 1814. The *Order Book*, kept by him when adj., was published in 1876.

MOOLTAN. See MULTÂN, *ante*.

MOON, THE, the satellite of the earth, revolving round the earth from w. to e. in a period of one *month* (q.v.), and in consequence accompanying the earth in its motion round the sun. As the moon, to an observer on the earth, advances more than 13° to the e. daily, whilst the corresponding advance of the sun is barely 1°, her progress among the stars is much more notable than that of the latter. This rapid angular motion, the continual and regular variation of her illuminated surface, and her large apparent size (being nearly equal to that of the sun), have rendered the moon an object of general interest; while her importance as the principal nocturnal substitute for the sun, and her special value to navigators and geographers, in the determination of longitudes (see LATITUDE and LONGITUDE), have rendered the *lunar theory* the object of the most thorough and careful investigation.

Phases of the Moon.—The first peculiarity about the moon that strikes a casual observer is the constant and regular change of her illuminated surface from a thin crescent to a circle, and *vice versâ*, and a corresponding change in the time of her appearance above the horizon. These changes depend upon the position of the moon relative to the earth and the sun, for it is only the half of the moon facing the sun that is illuminated by his rays, and the whole of this illuminated portion can only be seen from the earth when the sun, earth, and moon are in a straight line (the *line of syzygies*), and the earth is between the sun and moon. When the moon is in the line of syzygies, but between the earth and the sun, no part of her illuminated disk can be seen from the earth. In the former case, the moon is said to be *full*, and in the latter, *new*. A few hours after "new moon," the moon appears a little to the *east* of the sun as a thin crescent, with the horns pointing toward the *east*, and as she increases her angular distance from the sun at the rate of about 12° daily, the crescent of light becomes broader, till, after the lapse of a little more than seven days, at which time she is 90° in advance of the sun, she presents the appearance of a semicircle of light. The moon is then said to have completed her *first quarter*. Continuing her course, she becomes "gibbous" (q.v.); and at the 15th or 16th day from new moon, attains a position 180° in advance of the sun, and now presents the appearance known as *full moon*. From this point she begins to approach the sun, again appearing gibbous, and after a third period of more than seven days, reaches a point 90° w. of him, and enters her *last quarter*. Here, again, she appears as a semicircle of light, the illuminated portion being that which was not illuminated at the end of the first quarter. The moon now rapidly approaching the sun, resumes the crescent form, but this time with the horns pointing *westward*, the crescent becoming thinner and thinner, till the moon reaches the position of new moon, and disappears. From "full moon" to "new moon," the moon is said to be *waning;* and from "new moon" to "full moon," *waxing*. The earth as seen from the moon presents similar phases, and has, consequently, at the time of new moon, the appearance of a round illuminated disk, and at full moon is invisible. This explains the peculiar phenomenon occasionally observed when the moon is near the sun (either before or after new moon), of the part of the moon's face which is unilluminated by the sun appearing faintly visible, owing to the reflection upon it of strong earth-light. This phenomenon is designated by the Scottish peasantry as "the new mune wi' the auld mune in her airms." At new moon, the moon of course comes above the horizon about the same time as the sun, and sets with him, but rises each day about 50 minutes later than on the day previous, and at the end of the first quarter, rises at midday, and sets at midnight, continuing to lag behind the sun. When at the full, she rises about sunset, and sets about sunrise, and at the commencement of her last quarter, she rises at midnight, and sets at midday.

Distance and Magnitude.—From repeated observations of the moon's horizontal *parallax* (q.v.), and of the occultations by her of the fixed stars, her mean distance* from the earth has been estimated at 237,600 m., and as her angular diameter averages 31′ 26″, her actual diameter is 2,153 m., or a little less than $\frac{3}{11}$ths of the earth's diameter. Her volume is therefore about $\frac{1}{49}$th of that of the earth, and her density being only .577 (that of the earth being taken as unity), her mass is only $\frac{1}{88}$th of the earth's mass; consequently, the force of gravity at her surface is so much less than it is at the surface of the earth, that a body which weighs 1000 lbs. here, would at the moon weigh only 163 lbs.

Orbit.—The moon revolves round the earth in an elliptic orbit, with the earth in the focus; the eccentricity of the ellipse being equal to .05491 of half its major axis, or more than 3¼ times that of the earth's orbit. The plane of her orbit does not coincide with the ecliptic, but is inclined to it at an angle of 5° 8′ 47.9″, and intersects it in two opposite points, which are called the *nodes* (q.v.). The point at which the moon is nearest to the earth is called her *perigee*, and that at which she is furthest from it her *apogee*, and the line joining these two points is called the *line of apsides*. Were the moon's orbit a true ellipse, which, owing to various irregularities known as *perturbations*, it is not, the *lunar theory* would be exceedingly simple; but these perturbations, which, in the case of the planets, produce a sensible variation in their orbit only after many revolutions, cause, in the case of the moon, a distinct and well-marked deviation from her previous course in a single revolution. The retrogradation of her nodes along the ecliptic causes a continual change in the plane of her orbit, so that if, during one revolution round the earth, she occults certain stars, at the next revolution she will pass to one side of them, and will remove further and further from them in each successive revolution. A little consideration will show that by this continual change of her orbit, the moon will, in course of time, pass over or occult every star situated within 5° 24′ 30″ of the ecliptic. The motion of the nodes is so rapid that they perform a complete circuit of the orbit in 6793.39 mean solar days, or 18.6 years. Another important change in the moon's orbit is the revolution of the line of apsides, by which the perigee and apogee are continually changing their position relative to the earth and sun. This revolution is more than twice as rapid as that of the nodes, being performed in 3232.57 mean solar days, or 8.85 solar years. As this motion is common to all the heavenly bodies, its nature and origin will be treated of under the head of perturbations (q.v.). Its effect upon the moon is to produce a variation in her distance from the earth, independent of that produced by her elliptic motion.

Eclipses.—As the moon in her course passes the sun at the commencement of every (synodic) month, and by the middle of the month has placed the earth between herself and the sun, it is evident that if she moved in the plane of the ecliptic, there would be either a *total* or an *annular eclipse of the sun* at the commencement, and a *total eclipse of the moon* in the middle of every month. The inclination of her orbit allowing her to pass the sun 5° 9' to the n. or s. of his track, prevents such a frequent occurrence of eclipses. If the moon, when in conjunction, is at either of her nodal points, and at the same time near her perigee, a total eclipse of the sun takes place; but if near her apogee, the eclipse is only annular, for at that time her apparent diameter is less than the sun's. If also, at her conjunction, her latitude n. or s. is less than the sum of her semi-diameter and of that of the sun, a *partial* eclipse takes place, and is greater the nearer the moon is to her node. These partial eclipses are seldom seen from all parts of the earth's illuminated surface, but are confined to a portion of it, which is greater or less according to the extent of the eclipse. Lunar eclipses, which occur when the moon is in opposition (i.e., at full moon), are seen equally from all parts of the earth's surface which are turned towards her. The conical shadow of the earth which is projected into space on the side opposite to the sun, is in length equal to about 3⅝ times the moon's mean distance, and a section of it at the moon's distance is 1° 23' in diameter. If, then, the moon, which is never more than 33¼' in diameter, happens to be at or near her node, a *total* eclipse will take place, and in no case can it be *annular*, as is sometimes the case with those of the sun. Even during total eclipses, the moon is seldom quite invisible, but generally shines with a faint copper-colored light. See ECLIPSES.

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* When the moon is at the *perigee*, she is within 225,000 m., and when at the *apogee*, more than 251,000 m. from the earth; her angular diameter as measured from the earth consequently varies from 28′ 45″ to 33′ 30″ and for a particular day is greatest when she is on the meridian, as in this case she is nearer to the spectator, by about 4,000 m., than when she is on the horizon.

Rotation.—The moon, like all other satellites, as far as at present known, revolves round her own axis in precisely the same time that she revolves round the earth; she thus presents always the same face to us, and consequently, though her comparative proximity has enabled us to become better acquainted with her surface than with that of any other heavenly body, our knowledge is confined to one half of her surface, with the slight exception of the knowledge obtained from her *libration* (q.v.). To the inhabitants of the side of the moon next the earth—if the moon had inhabitants, which is very improbable—the latter would appear as a luminary about 2° in diameter, immovably fixed in their sky, or at least changing its position only to the extent due to the moon's libration. The earth would thus seem to them to have a disk about 15 times larger than that of the sun.

Physical Features.—The surface of the moon, as seen from the earth, presents a most irregular grouping of light and shade. The dark portions were named by the earlier astronomers as seas, lakes, etc., and still retain these names, although there is strong evidence against the supposition that the moon, or at least that portion of it presented to us, contains any water. The brighter parts of the moon are mountainous, as is proved by the fact of their casting shadows when the sun's rays fall upon them obliquely, and also by the ragged appearance presented by the interior illuminated border of the moon, an appearance which can only be satisfactorily accounted for on the supposition that the surface of the moon is not level, in which case the higher portions will be illuminated some time before the light reaches the level parts; and it is observed that as the illumination proceeds, bright spots start up in advance of it, and when the moon is on the wane, these same spots continue to shine for some time after the surrounding surface is immersed in gloom. The mountains occur either singly, when they are generally of a circular form, and are called *craters*, or in groups, which are mostly annular, and form a sort of wall inclosing a deep depression or plain, in which are situated one or more conical mountains. The craters are not unfrequently 8 or 10 m. in diameter, and some of the walled plains measure more than 100 m. across. The principal mountain range is the Apennines, which crosses the surface from n.e. to s.w., and attains, according to some authorities, an altitude of about 20,000 ft., though sir John Herschel gives about 2 m. as the probable limit of elevation above the moon's surface. The heights are estimated from a micrometric measurement of the length of their shadows, a method not, in this case, susceptible of much accuracy. The moon everywhere presents traces of volcanic agency, but no active volcanoes have yet been discovered, nor is there any sign of recent volcanic action. Seen through the telescope, she presents a bleak, desolate appearance, without indications of animal or vegetable existence. She appears to be devoid of an atmosphere, or, if one exists, it must be of exceeding rarity.

The influence of the moon in causing *tides* (q.v.) has long been well known, and there is some reason for supposing that she produces a similar effect on the atmosphere, combining with other causes in the generation of winds. Those winds which prevail about the time of new and full moon, and at the vernal and autumnal equinoxes, are particularly ascribed to her influence. On the supposition that the moon might also affect organic nature, experiments were instituted by Mead, Hoffmann, and others; but no certain results were attained. The periodicity which has often been noticed in certain diseases, especially in insanity (hence called *lunacy*), was long supposed to have some connection with lunar influence, and this opinion is held to some extent at the present day. The chemical effects of the moon's rays are, so far as is at present known, feeble, though in particular instances they exhibit an *actinism* as powerful as that of the sun. Decomposition of animal matter takes place more rapidly in moonshine than in darkness, and the moon's rays, when concentrated, have a sensible effect on the thermometer.

The best map of the moon is the large and accurate one of MM. Baer and Mädler, which presents a most minutely detailed picture of her visible surface; the map is 3 ft. in diameter. See for further information the articles PERTURBATIONS; LIBRATION; NODES; EVECTION; METONIC CYCLE; TABLES, LUNAR, etc.

Superstitions regarding the Moon.—The moon was anciently an object of worship, and even in the 17th c. she was supposed, by the common people of England, to exercise great influence over human affairs. The times for killing animals for food, gathering herbs, cutting down wood for fuel, sowing seeds of various kinds, were all regulated by the "age" of the moon, and these set periods were considered to be a necessary part of practical knowledge, and ignorance or neglect of them to be infallibly productive of loss. There were similarly defined periods for taking particular medicines, and attempting the cure of particular diseases. Many such superstitions prevailed until a recent period in the Highlands of Scotland, favorable or unfavorable consequences from any occurrence being predicted according to the age of the moon at the time it happened. Throughout Scotland, the waning moon was considered to have an evil influence, and full or new moon to be the most auspicious season for commencing any enterprise. The same opinion was held in Scandinavia and Germany, and the history of all nations teems with similar superstitions. See the article ECLIPSES.

In the Edda, we read that "Mundilföri had two children—a son, Mâni (moon), and a daughter, Sôl (sun);" and in German, the moon is masculine and the sun feminine to this day. It was the same in Ang.-Sax.; although modern English has in this matter followed the classic mythology, in which Phœbus and Sol are gods; and Selene, Luna, and Diana are goddesses; Grimm (*Deutsche Mythologie*, p. 666) quotes an old invocation to the "New Moon, gracious lord" (Neuer Mon, holder herr), for increase of wealth; and down to recent times the German people were fond of speaking of "frau sonne," and "herr mond" ("lady sun," and "lord moon"). The same inversion (as it appears to us) of gender is found among the Lithuanians and Arabians, and even the ancient Mexican meztle (moon) was masculine. Among the Slaves, according to Grimm, the moon is mas., a star fem., and the sun neut. In Hindu mythology also, the moon—Chandra or Soma—is a male deity, represented by one myth as the son of the patriarch Atri, who procreated him from his eyes, but by another as arising from the milk-sea when it was churned by the gods for the attainment of the beverage of immortality. His wives are the 27 daughters of the patriarch Daksha, known as the nymphs of the lunar constellations. By one of them, Rohini, he had a son Budha (not to be confounded with Buddha), the regent of the planet Mercury, who begot on Ilâ, a son, Purûravas, who became the ancestor of a royal family, hence called the lunar dynasty.—The moon is generally represented as wearing white garments, with a mace in one hand, and riding in a chariot drawn by ten horses or antelopes. The animal sacred to him is the hare (the Hindus believing that an outline like that of a hare is visible on the moon); and the plants under his special patronage are a certain variety of the lotus, which flowers when the moon rises, and the soma plant, or *asclepias acida*. As the receptacle of the beverage of immortality, he is thus described in the Vishnu-Purâna: "The radiant sun supplies the moon, when reduced by the draughts of the gods to a single digit, with a single ray; and in the same proportion as the ruler of the night is exhausted by the celestials, it is replenished by the sun . . . . ; for the gods drink the nectar accumulated in the moon during half the month; and from this being their food, they are immortal: 33,000, 3,300, and 33 divinities drink the lunar nectar. When two digits remain, the moon enters the orbit of the sun, and abides in the ray called Amâ. . . . . In that orbit, the moon is immersed for a day and night in the water, thence it enters the branches and shoots of the trees, and thence goes to the sun. . . . . When the remaining portion of the moon consists of but a 15th part, the manes approach it in the afternoon, and drink the last portion, that sacred digit which is composed of nectar. . . . . In this manner the moon, with its cooling rays, nourishes the gods in the light fortnight (or the 15 days of the moon's increase), the manes in the dark fortnight (when in the wane); vegetables, with the cool nectary aqueous atoms it sheds upon them; and through their development it sustains men, animals, and insects, at the same time gratifying them by its radiance."

MOON'JAH, MUNJAH, or MOONYAH (*saccharum munja*), a grass of the same genus with the sugar-cane, a native of India, the leaves of which afford a useful fiber, of which ropes are made. The moonjah grows in vast abundance in the neighborhood of the Ganges, Indus, and other rivers. The fiber of the moonjah is very tough and strong. No proper trial seems yet to have been made of the qualities of the moonjah fiber, more carefully prepared; but considering the facility with which it could be obtained in any desirable quantity, it seems to deserve attention.—Very similar to the moonjah is the SARA or SHUR of Bengal (*saccharum sara*), another species of the same genus, the leaves of which are employed in the same way.

MOON, MOUNTAINS OF THE. The "Mountains of the Moon" have ever played an important part in the history of African geography, and have given rise to many curious hypotheses. Ptolemy, and until lately many of the ablest geographers, supposed that a very high chain of mountains crossed the continent of Africa from e. to w.; and they have continued to shift these mountains from one latitude to another, ranging from 10° n. to 10° s., but still keeping them within nearly the same meridional bounds. Dr. Beke, from his own researches and a minute study of the geography of eastern Africa, propounded the theory, that the so-called Mountains of the Moon run from n. to s. parallel to the coast of Zanzibar, instead of from e. to w.; forming, in fact, a continuation of the great Abyssinian table-land, and embracing the snow-capped mountains of Kenia and Kilimandjaro, which have an altitude of 20,000 feet.

The mass of mountains discovered by capt. Speke in 1858, round the head of lake Tanganyika, is considered by him, both from its crescent form and its position, to be part of the Mountains of the Moon of Ptolemy; but mountains of this height (6,000 to 10,000 ft.) could never be snow-clad so near the parallel of the equator.

MOONSEED, or yellow parilla, *menispermam canadense;* nat. order *menispermaceæ* (q.v.). The Canadian moonseed is a North American climbing plant having peltate, roundish-cordate, and angular leaves, small clusters of greenish-yellow flowers, and black, glaucous, roundish, kidney shaped drupes (stone fruit). The root was formerly known in commerce as Texas sarsaparilla; its botany was established by R. P. Thomas in 1855. The root is several feet long, about a quarter of an inch thick, cylindrical when dry, with longitudinal wrinkles, and thin, branching rootlets. It contains a small quantity of berberine, and a larger quantity of a white alkaloid soluble in ether, alcohol, and much water. It also contains starch, and other constituents which have not been examined. It is regarded as a tonic, alterative, and diuretic, similar in properties to sarsaparilla, and is used in scrofulous affections as a substitute for that plant.

MOONSTONE. See FELDSPAR.

MOORCROFT, WILLIAM, about 1780–1825; b. England; one of the earliest of veterinary surgeons, and also one of the earliest explorers of the Himalayas, and the lakes, rivers, and valleys of Chinese Tartary. An account of his travels was published in London in 1841, edited by prof. H. H. Wilson, entitled *Travels in the Himalayan Provinces of Hindustan and the Punjab, in Ladakh and Kashmir.*

MOORE, a co. in central North Carolina, drained by Cape Fear, Deep, and Little rivers, and many creeks; and traversed by the Raleigh and Augusta railroad; 760 sq.m.; pop. '70, 12,040. The surface is hilly and broken, covered in great part by forests. Cotton, Indian corn, wheat, and pork are the staples; coal has been found. Chief town, Carthage.

MOORE, a co. in s. central Tennessee, organized in 1872; drained by the Elk river and its creeks, and traversed by the Nashville, Chattanooga and St. Louis railroad; 160 sq.m.; pop. '80, 6,235—785 colored. The surface is broken and hilly, covered in great part by forests of oak, chestnut, walnut, and other valuable timber. The staple products are wheat, corn, and oats; limestone is found. Co. seat, Lynchburg.

MOORE, ALFRED, 1755–1810; b. N. C.; became capt. in 1775 in a North Carolina regiment whose col. was his uncle, col. James Moore. He afterwards threw up his commission, but, after the capture of Wilmington by the British, he enlisted a volunteer force, which did good service during the remainder of the war. In 1790, when his knowledge of the law was still extremely scanty, he was elected by the state legislature attorney-general, and he soon acquired sufficient legal learning to discharge with credit the duties of that office. In 1798 he took a seat on the bench of the state court, from which he was promoted the next year to the supreme court of the United States, where he remained till 1805.

MOORE, BENJAMIN, D.D., 1748–1816; b. Long island; graduated at King's, now Columbia college, in 1768; admitted to the ministry as deacon and priest in England, in 1774, by the bishop of London; returned to America and was assistant minister of Trinity church, New York, 1774–1800; became rector in 1800. In 1801 he was consecrated bishop of the Protestant Episcopal church of New York, and also appointed professor of logic and rhetoric in Columbia college. He was president of the college, 1800–11, continuing also to perform the duties of the ministry. Dr. Hobart, who succeeded him, was his assistant after he became disabled from paralysis. He was an accomplished scholar and an able preacher. He published two sermons in the *American Preacher;* also, a *Sermon before the General Convention; A Pamphlet in Vindication of Episcopal Services.* His *Posthumous Sermons* were published by his son, Clement C. Moore.

MOORE, CHARLES WHITLOCK, b. Boston, 1801; a prominent freemason, and for many years secretary of the Massachusetts grand lodge. He established *Zion's Herald,* at Boston, in 1823, and the *Freemason's Monthly Magazine* in 1841. He has published a number of masonic manuals.

MOORE, CLEMENT CLARK, LL.D., 1779–1863; b. in New York; son of bishop Moore of R. I.; educated at Columbia college, graduated in 1798, and, having made a specialty of the study of Hebrew, was appointed professor of biblical learning in the Protestant Episcopal theological seminary of New York (1821), having already, in 1809, published a Hebrew and English lexicon. In this institution he remained, some changes being made in the title of his professorship, until 1850, when he retired with the title of professor emeritus. The plot on which the seminary stands was the gift of Dr. Moore. He was a poet of merit; published a collection of poems in 1844, and in 1850 *George Castriot.* By far the best known of his poetical writings is the ballad beginning "'Twas the night before Christmas; and all through the house," etc.

MOORE, Erasmus Darwin, b. Conn., 1802; studied theology at New Haven in 1830; was pastor of the Congregational church at Natick, Mass., 1833–38, of Barre 1840–42; edited the *Boston Recorder* 1844–46, *Boston Reporter* 1846–49, *Congregationalist,* 1849–51. He published *Life Scenes in Mission Fields.*

MOORE, Frank, b. N. H., 1828; brother of George Henry. Became a journalist and general writer, in early life; in 1869 was appointed secretary of legation at Paris, and resided there, in the performance of his official duties, during the period of the Franco-German war and the commune. He edited and prepared the *Rebellion Record,* a voluminous and valuable chronicle of the American rebellion of 1860–65, published in 12 vols., 1861–71. He published *Diary of the American Revolution,* 2 vols.; *Songs and Ballads of the American Revolution; Lyrics of Loyalty* (songs of the war against rebellion); and *Rebel Rhymes and Rhapsodies*—a similar collection made from among the writers of the confederate side. In recent years he has devoted himself to journalism in New York, and is at present (1881) an editorial writer on the *N. Y. Commercial Advertiser.*

MOORE, George Henry, LL.D., b. N. H., 1823; went to New York at the age of 16 years, and assisted his father, then librarian of the N. Y. historical society, whom he succeeded in that position in 1849. He remained in this office until the foundation of the Lenox library, when he was named by the late James Lenox, esq., founder of the library, to be its first superintendent, which position he still holds (1881). He received his degree of LL.D. from the university of New York. He is a learned bibliographer and a skilled administrator, and to his capacity the N. Y. historical society owes in a great degree its progress from an insignificant beginning to a secure and eminent position among the leading literary institutions of the country. Mr. Moore has been a writer on certain special subjects concerning which he is a recognized authority. He published *The Treason of Charles Lee; Employment of Negroes in the Revolutionary Army; Notes on the History of Slavery in Massachusetts;* and *History of the Jurisprudence of New York.*

MOORE, Sir Henry, 1713–69; b. Jamaica; was made a baronet for suppressing a slave insurrection while governor of Jamaica; and next received the appointment of governor of New York, an office he retained from 1769 until his death.

MOORE, Henry, 1751–1843; b. in Dublin; became a Wesleyan Methodist; was admitted to probation in 1779, and for some years preached in Ireland, after which he was associated personally in John Wesley's work. As a revivalist and a preacher he had great success, and was the last to die of those whom Wesley had ordained. He wrote the *Life of John and Charles Wesley and Memoirs of the Family* (1824); *Memoir of Mary Fletcher;* and an autobiography, accompanied by an account of his life written by Mrs. Richard Smith (1844).

MOORE, Jacob Bailey, Jr., 1797–1853; b. N. H.; learned the printer's trade in Concord, where he worked in the office of the *Patriot,* a newspaper to which he contributed. He married into the family of the proprietor, and was taken into partnership by him but left the paper to found the *N. H. Statesman,* for the purpose of pressing the election of John Quincy Adams to the presidency. In 1828 he was made a member of the state legislature, and in the following year sheriff of Merrimack co., a position which he held for five years. He also edited the *N. H. Journal;* and in 1839 went to New York, where, for a brief period, he edited the *Daily Whig.* In 1841–45 he was employed in the post-office in Washington. In 1845 he was appointed librarian of the N. Y. historical society library, and in 1848 postmaster at San Francisco, Cal. He was one of the compilers of Farmer and Moore's *Historical Collections of New Hampshire,* one of the earliest publications in American local history. He also published a *History of Concord, N.H.; Laws of Trade in the United States; History of Andover; Gazetteer of New Hampshire;* and *Memoirs of American Governors.*

MOORE, Jesse Haile, b. Ill., 1817; educated at McKendree college, Lebanon, and in 1844 became principal of Georgetown seminary. He became pastor of the Methodist Episcopal church at Shelbyville in 1848, and was successively principal of Paris seminary and president of Quincy college. In 1862 he raised the 115th regiment of Illinois volunteers, and served through the war, retiring at its close with the brevet rank of brig. gen. He served in Congress, 1869–73.

MOORE, John, M.D., a Scottish physician and miscellaneous writer, son of the rev. Charles Moore, an Episcopalian clergyman, was born at Stirling in 1730. Educated at the university of Glasgow, he began the study of medicine and surgery under Dr. Gordon, surgeon, of that city, which study he followed up in Holland, London, and Paris, and then, as the partner of his old master, Dr. Gordon, began to practice in Glasgow. As medical attendant to the duke of Hamilton, he spent five years traveling on the continent, and on his return in 1778 settled in London. In 1779 he published *A View of Society and Manners in France, Switzerland, and Germany* (Lond. 2 vols. 8vo). In 1781 appeared *A View of Society and Manners in Italy* (2 vols. 8vo); in 1786 his *Medical Sketches,* in two parts; and in 1789 *Zeluco,* a novel (2 vols. 8vo)—the principal, or, at any rate, the most popular of his works. His other works are: *A Journal during a Residence in France,* 1792 (2 vols. Lond.), descriptive of scenes witnessed while at

Paris in the autumn of that year as medical attendant of the earl of Lauderdale; *A View of the Causes and Progress of the French Revolution* (2 vols. Lond. 1795); *Edward*, a novel (Lond. 1796); and *Mordaunt*, a novel (Lond. 1800, 3 vols. 8vo). He also edited a collected edition of Smollett's works, with a life of the author. He died at Richmond in Surrey, Feb. 20, 1802.

MOORE, Sir John, English gen., born at Glasgow 1761, was eldest son of the preceding. He entered the army as ensign when only 15, and served with distinction in Corsica as col.; in the West Indies as brig.gen.; in Ireland during the rebellion of 1798, and in the expedition to Holland as gen. of staff. He was in Egypt with the army under Abercromby, and obtained the order of the bath for his services in command of the reserve. When war again broke out in 1802 Moore served in Sicily and Sweden. In 1808 he was sent with a corps of 10,000 men to strengthen the English army in the peninsula. He arrived in Mondego bay Aug. 19, and assumed the chief command on the return to England of sir H. Burrard. In October he received instructions to co-operate with the forces of Spain in the expulsion of the French from the peninsula. He moved his army from Lisbon, with the intention of advancing by Valladolid to unite himself with the Spanish gen. Romana, and threaten the communications between Madrid and France. But the apathy of the Spaniards, and the successes of the French in various parts of the peninsula, soon placed him in a critical position. Yet he had determined to make a bold advance from Salamanca to attack Soult, when the news reached him that Madrid had fallen, and that Napoleon was marching to crush him at the head of 70.000 men. Moore's forces amounted to only 25,000 men, and he was consequently forced to retreat. In December he began a disastrous march from Astorga to Corunna, a route of nearly 250 miles, through a desolate and mountainous country, made almost impassable by snow and rain, and harassed by the enemy. The soldiers suffered intolerable hardships, and arrived at Corunna in a very distressed state. It was impossible to embark without fighting, and Soult was in readiness to attack as soon as the troops should begin to embark. The battle was mainly one of infantry, for the cavalry, after destroying their horses, had gone on board, and the bulk of the artillery, for which the ground was not adapted, had also been withdrawn. On Jan. 16, 1809, the French came on in four strong columns. A desperate battle ensued. While animating the 42d regiment in a brilliant charge in an early stage of the action Moore was struck by a cannon-ball on the left shoulder, and died in the moment of victory. The French were defeated with the loss of 2,000 men; and the funeral obsequies of the deceased soldier were performed with melancholy solemnity just before the embarkation of his troops. The British army in this expedition lost their magazines and 6,000 soldiers. A monument was erected to Moore's memory in St. Paul's cathedral.

MOORE, Martin, 1790–1866; b. Mass.; graduated at Brown university in 1820; was pastor of a Congregational church at Natick, Mass., for nearly 30 years, and afterwards at Cohasset. He edited the *Boston Recorder* for 20 years. He published *History of Natick; Life of John Eliot.* He was vice-president of the New England genealogical society in 1861–6.

MOORE, Nathaniel, f.ll.d., 1782–1872; b. New York; educated at Columbia college, and admitted to the bar. In 1817 he was appointed adjunct professor, and in 1820 full professor of Greek and Latin in Columbia college, where he remained till 1835, when he went abroad. On his return in 1837 he became librarian of the college, to whose presidency he was called in 1842. He held that office till 1849. He published *A Historical Sketch of Columbia College; Ancient Mineralogy; Lectures on the Greek Language and Literature;* and *Remarks on the Pronunciation of the Greek Language.*

MOORE, Richard Channing, d.d., 1762–1841; b. New York; educated at King's, now Columbia, college; became a physician; entered the ministry of the Protestant Episcopal church; was pastor at Rye, N.Y.; rector of St. Andrew's, Staten island, 1789–1809; rector of St. Stephen's, New York, 1809–14; consecrated bishop of Virginia in 1814 as successor of bishop Madison. He was a prominent leader in the evangelical branch of the Episcopal church. During the last twelve years of his life he had as an assistant bishop Meade, who succeeded him as bishop of the diocese. He published many *Charges*, and a sermon on *The Doctrines of the Church.*

MOORE, Thomas, the son of a small tradesman, who, through the influence of lord Moira, afterwards became a barrack-master in the army, was born in Dublin on May 28, 1779. At an early age he was placed at a school in which Sheridan had formerly been a pupil. In 1793 he was sent to the Dublin university, where he ultimately took the degree of b.a. Before entering the university he had written verses for a Dublin magazine; and while there he translated the *Odes* of Anacreon, in the hope of obtaining a classical premium, in which, however, he was disappointed. In Dublin he acquired Italian and French, and being fond of music, he learned to play on the piano—an accomplishment which was of service to him in his future career.

In 1798, with his translation of Anacreon in his pocket, he came to London to study law, and entered himself in the Middle Temple. In 1800 he published his translations, dedicated to George IV., then prince of Wales. In 1802 he produced his *Poetical Works of the Late Thomas Little*—a volume of sweet but licentious verse, which was a good deal blamed, and very widely read. In 1803, through the influence of lord Moira, he was appointed to a government post at Bermuda. He arrived there in Jan., 1804; but finding his situation disagreeable, he committed his duties into the hands of a deputy, and traveled in America previous to his return to England. His transatlantic experience seems to have cured him of the democratic ideas which he had imbibed in Dublin. On his return to England, he published *Odes and Epistles*, for which he was sharply taken to task in the *Edinburgh Review*. A duel between himself and Jeffrey was the consequence—over which Byron made so much mirth—and which resulted in the combatants becoming the most excellent friends. In 1807 he engaged with Mr. Power to produce the *Irish Melodies*, and on this work he was engaged at intervals up till 1834. In 1811 he married, and shortly after he went to reside in Derbyshire, where in 1813 he produced *The Twopenny Post-bag*, full of brilliant fancy—in which the tropes not only glittered but stung.

As up to this time he had produced nothing but fugitive pieces he became anxious to emulate his brethren, who wrote long poems, and published in quartos. He fixed on an oriental subject, and the Messrs. Longman agreed to purchase the poem for 3,000 guineas. In 1817 the long-expected *Lalla Rookh* appeared—brilliant as a fire-fly, and the whole English world applauded. After the publication he went to Paris, where he wrote *The Fudge Family*, which appeared in 1818. At this time he learned that his deputy in Bermuda had misconducted himself, and that he had become liable for a large sums, which was afterwards, however, considerably reduced. Lord Lansdowne paid the claim, and Moore repaid his lordship afterwards.

In 1819 Moore went to Paris with lord John Russell, and extended his tour to Italy, and saw lord Byron at Venice. He returned to Paris, where he brought his family, and fixed his residence till 1822. Here he wrote *The Loves of the Angels*, which appeared in 1823, and *The Epicurean*, a prose romance, which was not published till 1827. On his return to England he fixed his abode at Sloperton cottage, near Bowood, and issued the *Memoirs of Captain Rock* in 1824, and the *Life of Sheridan* in 1825.

Byron had handed over to Moore, for his own especial benefit, a manuscript autobiography, on the condition that it should not see the light till after its author's death. Byron died in 1824, and as, at the request of his lordship's relatives, the manuscript was destroyed, Moore then entered into arrangements with Murray to produce a life of the deceased poet. The *Life of Lord Byron* was published in 1830, in two volumes. Next year he published the *Life of Lord Edward Fitzgerald*. His last important work was a *History of Ireland*, published in *Lardner's Cyclopædia*. A pension of £300 per annum was conferred on him in 1835. In 1841 he brought out an edition of his entire poetical works. For the three years preceding his death, he was afflicted with softening of the brain. He died Feb. 25, 1852. His friend, lord John Russell, published his *Memoirs, Journal, and Correspondence*, in 8 vols. (1852–56).

Despite his popularity during his lifetime, Moore can hardly be placed in the rank of great poets. His muse is a spangled dancing-girl—light, airy, graceful, but nothing more. His most ambitious work, *The Loves of the Angels*, is far beneath the Miltonic, or even the Byronic standard. *Lalla Rookh* is brilliant, but fatiguing. He is most successful in polished satire and the lighter sentiments; and his reputation will ultimately rest on *The Twopenny Post-bag* and the *Irish Melodies*.

MOORE, William, b. Penn., in the 18th c.; father of the marchioness de Marbois. He was president of the state executive council for two years, from 1781, and long a merchant in Philadelphia.

MOORE, Zephaniah Swift, D.D., 1770–1822; b. Mass.; graduated at Dartmouth college in 1773; was pastor of the Congregational church at Leicester, Mass., in 1798; elected professor of languages in Dartmouth college in 1811; president of Williams college in 1815, and of Amherst in 1821. He was especially interested in natural science. He published *An Oration at Worcester; An Address to the Public in respect to Amherst College;* and two occasional *Sermons*.

MOORFOWL, Red Grouse, or, in books of natural history, Red Ptarmigan or Brown Ptarmigan (*Lagopus Scoticus*), a bird peculiar to the British islands, and affording more amusement to sportsmen than any other kind of feathered game in Britain. It is the bird generally known in Britain by the name *grouse*, although not a true species of grouse, but rather of ptarmigan (q.v.). The toes are completely feathered, as well as the legs; the bill is very short, and its base much concealed by feathers. The length of the moorfowl is about 16 in., of which about 4 in. belong to the tail. The tail is nearly square. The wings are short. The plumage is of a deep chestnut-brown color, marked on the back and wing-coverts with black spots, and on the under parts with undulating black lines; the four middle tail-feathers are also marked with transverse black lines. Above the eyes is a naked space (the cere), of a bright scarlet color. The moorfowl is plentiful in the moors of Scotland and the Hebrides, Wales, the north of England, and Ireland. It feeds on the tender tops of heath, crowberries, bilberries, etc.: and not unfrequently visits the fields of oats and other grain in the vicinity of the moors, particularly when the *stooks* remain long in the field in late and rainy harvests. The moorfowl is not polygamous, and pairs in spring, when the plumage—particularly of the male—assumes a lighter and redder tint. The female lays from eight to fifteen eggs. The nest is on the ground, often under shelter of a tuft of heath. The young run about very soon after they are hatched. "Grouse" remain in *coveys* (broods) from the time they are hatched till late in the autumn, after which they "pack" or assemble in large bodies. A cream-colored variety of moorfowl is sometimes found in the north of England. The moorfowl is easily domesticated, and breeds readily in an aviary, if supplied with heath for food.

MOORHEN. See GALLINULE.

MOORING (allied probably to Dutch *marren*, to delay, fasten; Eng. *marline*, for fastening the sail to the bolt-rope; Lat. *mora*, delay), a fastening to retain a ship in a given position. This may be either by her own anchors, or (which is the more common meaning of the term) by fixed and permanent buoy, which, on its part, is anchored to the bottom. . A chain-mooring is where a strong chain is stretched for some distance on the bottom, being securely anchored or otherwise made fast at each end, and perhaps in intermediate places. Numerous buoys are then floated from it, and it becomes the mooring-ground for many vessels. Chain-moorings are frequent in all large harbors where comparatively small vessels require to ride.

MOORISH ARCHITECTURE. See ARABIAN ARCHITECTURE.

MOORS (Lat. *mauri*, meaning dark; Spanish, *moros*) are a people who form the great majority of the population of Barbary. Their appearance indicates their origin, which is a mixture of the Mauri (from whom they derive their name), Numidians, Phenicians, Romans, and Arabs, who have successively held possession of the country. In consequence, they are found to vary considerably in appearance and character in different parts of Barbary, but all show more or less strongly the symptoms of a considerable infusion of Arabian blood. They are a well-formed race, with fine oriental features, and a mild and melancholy expression of countenance. They are more friendly and sociable than the Bedouins and Berbers, who inhabit the deserts and mountains; but are inferior to them in mental ability, besides being voluptuous and cruel. They constitute, generally speaking, the tradesmen, artizans, merchants, and agriculturalists of Barbary; but a considerable number lead a pastoral life. The dress of the Moors consists of a piece of woolen cloth, five ells in length by one and a half in breadth, called a "haique," which is thrown over the shoulders, and fastened round the body; it also serves as a covering by night. This, when supplemented by a pair of slippers, a red cap, and a hood, constitutes the sole habiliment of the people generally. In the towns, the "caftan" is generally worn over the haique. The Moors employ the Arabic language, but with many corruptions and deviations from the original, and these appear to increase toward the west.

As the Arab conquerors of Spain invaded that country from Africa, where they had largely recruited their forces, they were naturally enough called Moors, and in Spanish history the terms Moors, Saracens, and Arabs are synonymous. From this mixed Moorish-Arab race sprung the *Moriscoes*, who were permitted by Ferdinand the Catholic to remain in Spain after the expulsion of their countrymen, on condition of their embracing Christianity. A cruel persecution, which was originated by Philip II., drove them to rebellion (1567–70), and in 1571 many emigrated to Africa; those who remained being, to the number of 500,000, expelled in 1610 by Philip III.

The Moors first appear in modern history as the allies of the Vandals in their invasion of Africa, and were continually rebelling against the Byzantine emperor. They were next, after a severe struggle, conquered and converted by the Arabs in 707. In 1091 they were summoned by the latter into Spain, to aid in stemming the tide of Christian conquest; and after faithfully supporting the Arab calif of Cordova, etc., till his dominions fell into the hands of the king of Leon and Castile, they retired in 1238 to Granada, where they founded their kingdom. The kings of Granada carried on a vigorous, and, at the same time, chivalrous warfare with the kings of Castile; but at length, weakened by internal discord, were compelled to succumb to Ferdinand the Catholic in 1492. The Moors, or at least that portion of them who refused to adopt Christianity, were then expelled from Spain, and, in revenge, founded in 1518 the piratical states of Algiers and Tunis. Their subsequent history cannot be separated from that of Algiers, Tunis, and Morocco.

MOORSHEDABAD', a city in Hindustan, in a district of the same name, and in the province of Bengal, of which it was formerly the capital; 124 m. n. of Calcutta; pop. 46,182. Its name originally was Muksoosabad. Including Cossimbazar it extends 8 m. on both sides of Bhagiratty or Cossimbazar river, a branch of the Ganges. The city was never fortified except by an occasional rampart during the Mahratta invasion in 1742. The streets are so narrow as to be impassable for European carriages. The buildings are generally of mud. Most of them are of one story, with tiled roofs. Even the palace of the nawaub is hardly noticeable. A long, narrow, winding street runs from the market, containing poor huts, and this is intersected by other streets still narrower and very unpleasant. On account of defective drainage the place is very unhealthy, and in 1814 many Europeans suffered in the general mortality. It has an extensive inland traffic, and the river is constantly covered with boats. The staple products are silk and indigo. The town is favorably situated for commerce. A Mohammedan college, called

Nizamat college, was founded here several years ago, to which an English professorship was attached. In 1757 Calcutta became the capital of Bengal.

MOORUK (*Casuarius Bennettii*), a recently discovered bird of the same genus with the Cassowary (q.v.), of which it was at first regarded as a mere variety, a native of the island of New Britain. It is about 5 ft. in full height, 3 ft. to the top of the back, is of a reddish color, mixed with black, and has a horny plate instead of a helmet-like protuberance on the top of the head. The claw of the inner toe of each foot is very long. It becomes extremely tame and familiar in captivity; may be fed on potatoes, maize, or any similar food; and is apt to prove troublesome by swallowing anything, however indigestible, that may come in its way.

MOOSE. See Elk.

MOOSEHEAD LAKE, the largest lake in Maine, from which the Kennebec river takes its rise. It lies on the borders of Somerset and Piscataquis counties, about 75 m. n. by e. of Augusta; is 36 m. in length, from 3 to 10 in width; and is surrounded by a thickly wooded country that is sparsely inhabited. The forests abound in game, including the deer and caribou; and the lake, with the neighboring region, is much frequented by sportsmen. In the winter the lumbermen of the Kennebec cut much of their timber near its banks.

MOOSH, a t. of Asiatic Turkey, capital of a small pashalic of the same name; population estimated at 6,000. It is pleasantly situated on the sides and summit of a conical hill near the Murad Chai, or eastern arm of the Euphrates, 75 m. s.e. of Erzeroum. The plain in which it stands is about 40 m. in length and 12 or 14 m. in breadth, and is well-watered. The climate is variable. It contains 100 villages, and produces grain, tobacco, and wine of good quality. The town presents a poor appearance. It is inhabited by Turks and Armenians, the latter, having the trade of the place, are wealthy, and pay an annual tribute of £2,000, from which the Turks are exempt. There are 7 mosques, 4 churches, and several large, well-furnished bazaars. Coarse cotton cloth is manufactured here. The chief articles of export are tobacco and cattle. But a small quantity of European manufactures is imported.

MOQUE GUA, a t. of Peru, capital of a province of the same name, 68 m. n.w. of Tacna, on the great route w. of the Cordilleras. In the province are many large vineyards, which produce great quantities of wine and brandy. Pop. 9,000.

MOQUIS, the name of a tribe of Indians living in n.w. Arizona, on the Little Colorado and San Juan rivers. They are known as far back as the middle of the 16th c., when they were visited by the Europeans, and received from them certain domestic animals, including sheep, the breed of which they continue to hold. Missionaries were sent among them by the Franciscans, but in the latter part of the 17th c. there was a general rising of the Moquis, when the missionaries were exterminated. An attempt in 1723, on the part of the viceroy of Mexico, to subdue this tribe, was unsuccessful; but 25 years later a new Franciscan mission had been effectual in making converts among them. Since that time they became peaceable, only resisting the attacks of the Apaches and Navajoes, who became their bitter foes, and have harassed them greatly. They are agricultural; are divided into 9 subdivisions, or families; and dwell in villages of houses built after the manner of the Indians of New Mexico. At the time when the United States government first took them in charge the Moquis were estimated to number 8,000; but in 1855 they were severely afflicted by an epidemic of small-pox, and their numbers much reduced; and, again, they suffered from famine in 1866. Their number in 1872 was reported at 1663. They are not intemperate, and their women are noted for chastity.

MORA, a genus of trees of the natural order *leguminosæ*, sub-order *cæsalpinieæ*, containing only one knows species, *M. excelsa*, discovered by sir R. Schomburgk, and described by him as the most majestic tree of Guiana. The timber is said to be equal to oak of the finest quality. It is already a considerable article of commerce, under the name of *mora wood*. It is darker than mahogany. It is valued for ship-building.

MO'RA (Lat.) is a word often used in Scotch law to denote delay caused by negligence. In England and Ireland the corresponding word is laches (q.v.).

MORA, a co. in n.e. New Mexico, adjoining Texas; 5,000 sq.m.; pop. '70, 8,056—7,775 of American birth. The surface, especially in the w. portions, is mountainous, intersected in the w. by a ridge from the Rocky mountains. Most of the county is a wide, treeless plain. The Canadian river and Mora creek flow through it. The principal productions are Indian corn, wheat, oats, hay, and wool. There are manufactories of flour and wool. Co. seat, Mora.

MORA'CEÆ, a natural order of exogenous plants, or, according to many botanists, a sub-order of *urticeæ* (q.v.). The moraceæ are trees or shrubs with rough leaves and sometimes with climbing stems; they have a milky juice; the flowers are very small; the fruits of many flowers are often inclosed in a succulent receptacle, or the calyx becoming fleshy, all the fruits of a head or spike become combined into one. There are about 200 known species, natives of temperate and tropical climates. Some are valuable for their fruit, some for the caoutchouc obtained from their milky juice, and different parts of others are applied to various uses. Among the species are figs, mulberries, Osage orange, fustic, and contrayerva.

MORADABAD', a t. of British India, capital of a district of the same name, is situated on a slightly elevated ridge between the Ramgunga and the Ganges, 90 m. e.n.e. of Delhi. There is a large jail, capable of holding 1800, for native convicts. West of the town, and separated from it by the jail, are the cantonments for the troops, agreeably situated amid luxuriant trees; the chief duty of the troops is to guard the convicts. Pop. (at census of N.W. Provinces, 1872) 62,417.

MORAINE'. The masses of rock which, by atmospheric action, are separated from the mountains bounding the valleys along which glaciers flow, find a temporary resting-place on the surface of the ice, at the margin of the glacier, and are carried along with it, but so slowly that they form a continuous line along each margin. These lines of débris are called *lateral moraines.* When two glaciers unite, the two inner moraines unite also, and form one large trail in the middle of the trunk glacier, and this is called a *medial moraine.* A large portion of these rocky fragments at length reaches the end of the glacier, and here the melting ice leaves it as a huge mound, which is known as a *terminal moraine.* See GLACIER.

MORALES, LUIS DE, 1509-86; b. Spain; studied the works of the Spanish masters, and was called *El Divino,* "the divine," from his preference for sacred subjects. His Saviors and Magdalenes are exact representations of suffering borne with meekness. His best work is the "St. Veronica" in the church of the Barefooted Trinitarians in Madrid.

MORALITIES. See MYSTERIES.

MORALS. See ETHICS.

MORAN, BENJAMIN, b. Penn., 1820; at first a printer in Philadelphia. He made a tour of England, on foot, in 1850, publishing an account of it in 1853, under the title of *The Footpath and the Highway.* In 1854 he became private secretary to James Buchanan, then American minister to England. In 1855 he was appointed secretary of the American legation in London, where he remained till 1874, when he became minister to Portugal, which post he still retains (1881).

MORAN, EDWARD, b. Lancashire, Eng., 1829; removed with his parents while young to Philadelphia, and became a pupil there of James Hamilton, a well-known marine painter. His work early indicated much aptitude for this class of subjects, and his paintings were of a good order of merit from the first. He went to London in 1862, remained abroad long enough to profit by the study of the great marine painters of England and the continent, and returned to reside in New York in 1869. His works have found steady sale, and have frequently been the originals for engravings. Among them are "Outward Bound," "Lanch of the Life-Boat," "The Burning Yacht," "Minot Ledge Light," "The Coming Storm in New York Bay," "Solitude," and "Dream Life." Mr. Moran is careful in the finish of his pictures, and has confined his brush almost exclusively to marine subjects. He is an associate of the national academy of N. Y., where he now resides, and a member of the society of American artists.

MORAN, PETER, b. Lancashire, Eng., 1842; brought by his parents to Philadelphia, where he was educated, and then put with a lithographer to learn his art. He did not like it; and deserted it for the studios of his elder brothers, where he found his vocation in a field slightly different from theirs and yet allied. His taste led him to pastoral and quiet scenes in country life, and especially to animal painting, though he has not confined himself to still-life pictures. "Twilight," "The Return of the Herd," "The Thunderstorm," "Fog on a Sea-Shore," and "Settled Rain," are the names of a few of the paintings which have given him celebrity, and indicate his appreciation of the poetic aspects of still-life in nature. The "Return of the Herd" received a medal at the centennial exhibition.

MORAN, THOMAS, b. in Lancashire, Eng., 1837. When seven years old his family came to Philadelphia, where Thomas was educated in the city schools, and then apprenticed to Mr. Scattergood, an engraver. During this apprenticeship he devoted all his spare time by day to painting in water colors and the study of painting, and his evenings to drawing. His success was immediate: his water-color paintings sold quickly at good prices. When master of water-colors, and studying from nature, he perceived the greater range of oil painting, and at 23 years of age turned his attention to that department. When 25 he visited England. In 1866 he again went to Europe, visited England, France, and Italy, and remained several years for work. He returned in 1871 and joined prof. Hayden's party of exploration to the head waters of the Yellowstone river, where he made the sketches from which he produced the picture of the "Grand Cañon of the Yellowstone," purchased by congress, and now filling a panel in the capitol at Washington. The following year he visited the Yosemite and the Sierras of California and Nevada. In 1873 he joined the U. S. exploring expedition, conducted by maj. J. W. Powell, which surveyed the wonderful canyons of the Colorado river in Colorado and Utah, and on his return completed a picture of "The Chasm of the Colorado," which was purchased by congress as a companion to the Yellowstone picture. The following year he visited the mountain of the Holy Cross in Colorado, and on his return to New York, where he has made his residence, he finished a picture of that mountain, which ranks as one of his grand works. These are a few of Mr. Moran's large works. Of smaller pieces he has been a prolific worker in every department of landscape art. Among these are: "The Lost Arrow," "The Ripening of the Leaf," "Dreamland," "The Groves were God's First Temples," "The Pictured Rocks of Lake Superior," "The Conemaugh in Autumn," "The First Ship," "The Flight into Egypt," "The Remorse of Cain," "The Children of the Mountain," "The Track of the Storm," "Ponce de Leon in Florida," "New York from Communipaw," and "After a Thaw." It is to Mr. Moran's skilled pencil that the world is indebted for the superb illustrations on wood that adorn the reports of both Hayden's and Powell's explorations and the most spirited recent engravings of Rocky mountain scenery. "The Wonders of the Yellowstone," which have been illustrated in chromo by L. Prang & Co., are from his water-color sketches. Mr. Moran's style is marked neither by over-care nor by carelessness of finish. In the "After a Thaw," a locomotive on the flushed flats of New Jersey, seen through a spring mist, becomes a picture of poetic beauty.

MORA'NO, a city of southern Italy, in the province of Cosenza, built on a hill in a wild and rugged neighborhood, 35 m. n.n.w. of Cosenza. Pop. 8,350. It has good manufactures of silk, cotton, and woolen fabrics.

MORAT (Lat. *Moratum*, Ger. *Murten*), a t. of, '71, 2,328 inhabitants, in the canton of Freiburg, Switzerland, on the lake of Morat, about 12 m. from Bern, famous for the victory of the Swiss and their allies over Charles the bold, duke of Burgundy, June 22, 1476. The duke, exasperated by his defeat at Grandson in March, appeared before the gates of Morat with 40,000 men. The Swiss were aided by Strasburg, Basel, Colmar, and other Rhenish cities, and by duke René of Lorraine, whom the duke of Burgundy had driven from his possessions; but the superiority of numbers was greatly on the side of the duke of Burgundy. The assault of the Swiss, however, was very impetuous, and their victory complete; the duke's camp fell into their hands, and he himself only escaped by the swiftness of his horse.

MORATA, Olympia Fulvia, 1526–55; b. Ferrara; was carefully educated, and became an accomplished classical scholar. She is said to have given lectures on classical subjects at Ferrara in her 16th year. She afterward married a German physician named Andreas Grunthler, and was converted to Protestantism. In 1553 margrave Albert of Brandenburg pillaged Schweinfurt, where she was living, and she lost her library, and was forced to take refuge in Hammelburg. Grunthler was presently appointed a professor at Heidelberg, where she went to reside. She published many poems, written in Greek or Latin.

MORATIN, Leandro Fernandez de, the most eminent comic poet that Spain has produced in recent times, was b. at Madrid Mar. 10, 1760. His father, Nicolas Fernandez de Moratin, was also a poet of some eminence, but having found that literary labors afforded a precarious support, he wished his son to learn the trade of a jeweler, by which, after his father's death, he, in fact, for some time supported himself and his mother. In 1790 appeared his first and best comedy, *El Viejo y la Nina;* it was followed by *La Comedia nuova El Baron*, *La Mogigata*, and *Elsi de las Niñas*. Prince Godoy conferred several ecclesiastical benefices upon him, though the inquisition set its evil eye upon the poet. Joseph Bonaparte made him chief royal librarian; and after 1814 he took refuge in Paris. His last work was the *Origenes del Teatro Español*. He died in Paris June 21, 1828.

MORATIN, Nicolas Fernandez de, 1737–80; b. Madrid; a friend of Montiano, the restorer of classical tragedy in Spain. Following the example of Montiano and Luzan, he attempted to reform the drama, and to purge it of romanticism. In 1762 he published three discourses against the older drama, under the title of *Desengaños al Teatro Español*. In these discourses he bitterly attacked the old characteristic *Autos Sacramentales*, which were suppressed by the government in 1765. In the same year that the discourses appeared he wrote a comedy, *La Pentimètra*, in the French manner: neither this, nor his tradgedy *Lucrecia*, was represented, on account of the strong prejudice then prevailing in Spain against French innovations. In 1770 he succeeded in having his tragedy of *Hormesinda* produced on the stage, and it was favorably received. He wrote but one more tragedy, *Guzman el Buene*, which was never performed. Before this, he had turned his talents in the direction in which he was to do his best work, and had published, in 1764, a collection of verses called *El Poéta*. This was followed the next year by *Diana*, a didactic poem on the chase. His most important work, a historical epic called *Las Náves de Cortès Destruidas*, appeared the same year. Moratin at first practiced law, but was afterward made professor of poetry in the imperial college at Madrid. He formed a club, which met at Madrid and considered the productions of contemporary literature. He was on intimate terms with the chief scholars and authors of Spain.—Cadahalso, Ayala, Montiano, the botanist Ortega, and Fajardo, the translator of Buffon. His posthumous works were published by his son Leandro, in 1821.

MO'RAVA, the chief river of Servia. It is formed by the union of two head streams —the eastern or Bulgarian Morava, which rises in the mountains to the s. of the new southern frontier of Servia; and the western or Servian Morava, which rises on the western frontier. The united stream flows northward to the Danube, and has a total length of about 180 miles.

MO'RAVA, or, more properly, March (called by the ancients *Marus*), a river of Austria, has its origin on the southern slope of the Schneeberg, on the borders of Prussian Silesia, 3.882 ft. above sea-level. It is the chief river of Moravia, to which it gives its name, and flows s. through that crown-land, receiving on the right the Thaya, and falling into the Danube, 8 m. above Presburg. In its lower course, it forms the boundary between Lower Austria and Hungary. Its course is 184 m. in length, and it is navigable from Göding, upward of 60 m. from its mouth.

MORA'VIA (Ger. *Mähren*), a crown-land of the Austrian empire, situated in 48° 40′ to 50° n. lat., and 15° 5′ to 18° 45′ e. long. It is bounded n. by Prussian and Austrian Silesia, e. by Hungary and Galicia, s. by the duchy of Austria, and w. by Bohemia. The superficial area is about 8,480 sq.m.; and the pop. in 1870 was 2,017,974.

Moravia is inclosed and traversed on all sides by mountains, being separated from Silesia by the range of the Sudetes; from Bohemia, by the Moravian chain; and from Hungary, by the Carpathian mountains; while branches of these various chains intersect the whole country except in the s., where the land consists of extensive plains, lying about 800 ft. above the level of the sea. The numerous small rivers of the interior follow a s.e. direction, and fall into the March or Morava, from which the country derives its name, and then flow together with the latter into the Danube. The Oder, and its affluents the Elsa and Oppa, rise among the mountains on the n.e., from whence their course is soon turned directly away from the Moravian territory. There are few extensive lakes, but numerous ponds and small streams, which abound in fish. The more elevated parts of the country are not fertile, and the climate is severe; but in the mountain valleys and on the southern plains the soil is remarkably rich, and the temperature more genial than in other European countries lying in the same parallel. Moravia, which ranks as one of the richest of the Austrian dominions, has half of its area in arable land. It yields fine crops of grain, and among the other natural products grown for exportation we may instance hops, mustard, potatoes, clover-seed, beet-root; and in the s., maize, grapes, chestnuts, and many other of the less hardy fruits and vegetables. The breeding of cattle and sheep, and the making of cheese from sheep's milk, constitute an important branch of industry; in the southern districts of the Hanna (a plain famous for its fertility), horses are bred for exportation. Geese and fowls are reared in large numbers for the sake of their feathers, and the keeping of bees is conducted with great success. The mineral products include iron, alum, saltpeter, coal, graphite, wetstones, sulphur, vitriol, pipe-clay, marble, and topazes, garnets, and other precious stones.

Industry, etc.—The principal branches of industry are the manufacture of linen and thread, which now enjoy a European reputation, and those for cotton goods at Sternberg. Moravia has long been noted for the excellence of its cloths, flannels, and other woolen fabrics, and for its leather goods. The minerals of Moravia, especially coal and iron, are important, and are extensively wrought. Beet-sugar is largely manufactured. Brünn (q.v.), the capital, is the chief emporium for the manufacturing trade, and Olmütz (q.v.) the principal cattle-mart.

The educational wants of the province are provided for by 12 gymnasia and about 1900 schools. The former university at Olmütz is now represented by a theological faculty, and by a large technical institute. The majority of the people belong to the church of Rome. There are about 50,000 Protestants and 40,000 Jews.

In regard to nationality, the population may be divided as follows: About 500,000 Germans, nearly a million and a half of Slavs, and 50,000 belonging to other races (including Jews). The Slavs of Moravia are mostly Czechs, with Poles and a few Croats. The Czechs are inferior in all respects to their brethren in Bohemia. The Moravian Poles, although inferior to the Germans as regards industry and cultivation, are a physically well developed, courageous, and enterprising people.

History.—Moravia was anciently occupied by the Quadi, who, on their migration in the 5th c. to Gaul and Hispania, were replaced first by the Rugii, next by the Heruli and Longobardi, and finally by a colony of Slavonians, who, on their settlement in the country, took the name of Moravians, from the river Morava. Charlemagne, who brought the people under nominal subjection after they had spread themselves over a territory greater than the present Moravia, constrained their king, Samoslav, to receive baptism; but Christianity was first formally established in the middle of the 9th c. by Cyril, who must be regarded as the true apostle of the land. Moravia was made tributary to the German empire before the close of the century; but in 1029 it was incorporated with Bohemia, after having for a time been a prey to the incursive attacks of its Slavonic and Teutonic neighbors. At the close of the 12th c. Moravia was erected into a margraviate, and declared a fief of Bohemia, to be held from the crown by the younger branches of the royal house. On the death of Louis II. at the battle of Mohacz in 1526, Moravia, with all the other Bohemian lands, fell to Austria, in accordance with a pre-existing compact of succession between the royal houses. Since then it has shared the fortunes of the empire, and in 1849 it was formally separated from Bohemia, and declared a distinct province and crown-land.

MORAVIANS (called also *United Brethren*, *Moravian Brethren*, or *Bohemian Brethren*), a religious community, tracing its origin to the followers of John Huss, who were expelled by persecution from Bohemia and Moravia in the beginning of the 18th c., and of whom a small company, consisting at first of only 10 persons, received permission from count Zinzendorf (q.v.), in 1722, to settle on his estate of Berthelsdorf, in Saxony. To this settlement they gave the name of Herrnhut, whence they are commonly known in Germany as Hernhuters. It rapidly increased, not only by the accession of additional Bohemian and Moravian refugees, but also of other Christians, who were attracted by the faith and piety which remarkably prevailed in it. Zinzendorf joined the little brotherhood, devoted his whole estate to the propagation of Christianity, and undertook the work of the ministry. The doctrines which they received being those of the Augsburg confession, it was proposed that they should unite themselves with the Luthern church; but a difference of opinion existing on this point, it was decided, as difficult questions still sometimes are among the Moravian, by an appeal to the lot; and the result was, that the *United Brethren*, or *Unitas Fratrum*, as they termed themselves, remained a distinct community, and adopted an organization of their own. Till Zinzendorf's death in 1760, he was really their leader, and was recognized by them as *ordinarius*. After his death, their organization was completed by synods held in 1764 and 1769.

The Moravians are recognized by the state in Germany, as Protestants attached to the Augsburg confession. They have no symbolical books of their own, although they drew up a simple and brief confession of their faith in 1727, and a brief statement of principles was emitted by a synod held in 1775.

The Moravians profess to be connected with the Bohemian or Moravian Brethren of former times by a regular succession of bishops. The bishops, however, exercise no episcopal authority, and their chief peculiar function is that of ordination, of which they alone have the power. Every congregation is governed by a *conference of elders*. The elders are bound to visit each family once in three months, and to report concerning the maintenance of family worship and the conduct of the brethren. It is also their duty to visit the sick, and to aid the poor with money contributed by the other brethren. The whole church is governed by synods, which meet—always in Germany—at intervals of ten or twelve years, and are composed not only of bishops, but also of other members of the brotherhood. Between one synod and another, all affairs are managed by a *conference of elders* appointed by the synod.

Moravians are to some extent scattered amongst the general population of the countries in which they dwell, as Britain and America; but they prefer, where it is possible, to live in colonies, or separate societies, and in these they carry out some very peculiar parts of their organization, particularly a division into *choirs* of children, youths, maidens, unmarried brethren, unmarried sisters, widowers, and widows, each having a separate leader or pastor. Unmarried brethren, unmarried sisters, widowers, and widows, reside in separate houses; married couples in houses of their own. Colonies of Moravians exist in England, America, Holland and other countries, but are most numerous in Germany. The most important *colonies*, however, are perhaps those in the mission-fields. The Brethren early entered on missionary work, and all the prosperity of their church has been evidently connected with their earnest prosecution of it. Their first mission was planted, in 1732, in the island of St. Thomas, in the West Indies; the missionaries who went thither expressing their resolution to become slaves, if necessary, in order to carry out their purpose. A mission to Greenland, which has been eminently successful, and may be said to have made Greenland a Christian country, was commenced in 1733. They have also interesting missions in Labrador and at the cape of Good Hope, and in other heathen countries. The Moravians have at their mission-stations about 70,000 converts from heathenism. One of the most interesting of their stations is at Sarepta, in the government of Saratov, in Russia, by which they are connected with the Tartars and Kalmucks. In all their settlements, the education of the young receives the utmost attention.

The religious services of the Moravians are conducted with great simplicity. They meet for worship daily, in the evening, the service being much like that of a *prayer-meeting* amongst other Christians. They use a litany on the Lord's day, but extemporary prayer is frequent. They admit the use of instrumental music. They maintain the practice of washing the feet, both in choirs and in congregations, before the communion. They meet on the last day of the year, to bring in the New Year with prayer and other exercises of religion. On Easter morning they assemble in the burying-ground to celebrate the resurrection of Christ, and to express their confidence concerning the brethren who have died during the preceding year. The death of a member of the brotherhood is made known in the chief settlements by sound of trumpets, as if for victory; the melody indicating the particular choir to which the deceased belonged. In some of the settlements peculiar dresses are worn by the members of particular choirs.

In 1875 there were in Europe 68 congregations of Moravians, with 9,121 communicants; and in America, 75 congregations, with 8,815 communicants. Seventeen bishops were living in 1875, of whom 6 were in the United States. There were 92 mission stations, with 333 missionaries, and above 1000 native assistants, having the care of 59,853 communicants.

MORAVIANS (*ante*), so named because Moravia was at one time their principal seat, existed as a body of Christians—I. From the time of John Huss, about the mid-middle of the 15th c., when they were more commonly called the Bohemian brethren. In 1456 some members of a parish in Prague, wishing for their own personal welfare to escape from the corruption of the national church, withdrew, by permission obtained from the regent of Bohemia through the intervention of their priest, to an estate called Lititz, on the eastern frontier, that had been desolated by war and was thinly inhabited. Their object was not to form a new sect, but to continue the reformation which Huss had commenced, limiting their efforts, however, to the society formed among themselves within the national church, the members of which were pledged to adhere to the Bible as the only rule of faith and practice, to maintain a scriptural discipline, and in administering the Lord's supper to employ the exact words of Christ without attempting any explanation of them. In 1457 they adopted a statement of their principles and committed it to the care and administration of 28 elders. They assumed at first the title of *Brethren and Sisters of the Law of Christ*, afterward shortening it to *The Brethren*. Still later the well-known Latin title *Unitas Fratrum*, Unity of the Brethren, came into use, and is now their official designation. Gregory the patriarch presided over them, and some of the priests of the national church ministered to them. Their influence rapidly extended through Bohemia and Moravia. Their elders made their principles known, and received many earnest inquirers into fellowship. In 1461 they suffered persecution. notwithstanding which they continued to grow. In 1464 three of the elders were intrusted with a special supervision of their affairs, and received written instructions for their guidance. In this document they say, "We are, above all, agreed to continue, through grace, sound in the faith of our Lord Jesus Christ; to be established in the righteousness which is of God, to maintain the bond of love among each other, and to have our hope in the living God. We will show this both in word and deed, assist each other in the spirit of love, live honestly, study to be meek, quiet, humble, sober, and patient, and thus to testify to others that we have in truth a sound faith, genuine love, and a sure and certain hope." To these principles they have ever remained true. They have manifested their faith by their works, and have diligently maintained scriptural discipline. Their confessions of faith have always magnified the importance of practical Christianity, and in their churches they have required evidence of personal piety, not the mere assent to a creed. In separating from the national church and ordaining a ministry for themselves they sought divine guidance by patient waiting, fasting, and prayer, and last of all by the use of the lot. In 1467 three men were appointed, again by lot, to the ministry, who were ordained first by their own presbyters, in accordance with what they believed had been the practice in apostolic times, and secondly as bishops by Waldensian bishops, that they might also conform to the custom of the churches in the age after the apostles, besides gaining thus a ministry that would be universally acknowledged. After this their numbers increased rapidly in all parts of Bohemia and Moravia. Differences of opinion concerning discipline caused them internal trouble. 1480–94; and grievous persecutions, 1468 and 1508, came upon them from without. The national church united with the Roman Catholics to exterminate them by means of imprisonment, spoliation, torture, and death. But again "the blood of the martyrs was the seed of the church." The persecutions came to an end, and the brethren renewed their numbers and their strength. When the reformation in the 16th c. began, they were in a flourishing condition, having churches in 400 parishes with at least 200,000 members, among whom were included some of high rank and influence. They used their own hymn-book, catechism, confession of faith, and printing-presses for multiplying Bibles and evangelical books. They were therefore truly, as they have been called, "reformers before the reformation." Yet, in full accordance with their character, they hailed the new movement with joy, entering into conference first with Luther, and afterward with the Swiss reformers. This fellowship was helpful to all parties. The doctrinal system of the Moravians was improved, and discipline and union among the reformers were promoted. The brethren established themselves in Poland, 1549, during the persecution inflicted on them by Ferdinand I. Large numbers of them, banished from Bohemia, removed to East Prussia, and thence one of them, George Israel, went to Poland, where he preached with great success. In 1557 the Polish churches were received into the union. Rudolph II., 1609, in compliance with the demands of his barons, granted a charter which secured religious liberty in Bohemia and Moravia. An evangelical consistory was formed at Prague in which the brethren as a legally acknowledged church were represented by one of their bishops. In 1619 the Bohemian revolution caused by the accession of Ferdinand II. changed the face of religious affairs, and developed into the Thirty-years war, during which Bohemia and Moravia were brought into subjection to Roman Catholic power. In 1621 the king, having put to death many Protestant nobles, began what was called the anti-reformation. Commissioners, aided by Jesuits and soldiers, went through the country to force the people back to the Roman church. Many laid down their lives; 30,000 families left the country, and the rest of the people were driven into an outward subjection. The Moravians, thus banished from their homes, re-appeared in other lands. About 100 new parishes were organized in Prussia, Hungary, and Poland. They had cherished the hope of returning to their own countries at the termination of the war. But at the peace of Westphalia these countries were not restored to the enjoyment of religious liberty. Eight years after that peace, their settlement in Poland was broken up by war between that country and Sweden. The members of their council were scattered, and their parishes were transferred to the Reformed church. For more than half a century their visible organization ceased to exist; only its hidden seed in Bohemia and Moravia remained. But their bishop, Amos Comenius, as if prophetically assured of their future re-appearance, published a new edition of their history, doctrines, and discipline; commended them to the care of the English church, and formed plans for preserving their episcopacy by consecrating clergymen of the Reformed church, with which they had been united in Poland.

II. *The renewed Moravian Church.*—In 1722 some of the "hidden seed" was revealed by the escape of several families from Moravia under the lead of Christian David. By invitation of count Zinzendorf they settled on his domain of Berthelsdorf, in Saxony, and within seven years about 300 others having joined them from Bohemia and Moravia, they built a town which they named Herrnhut, "the watch of the Lord," and which was soon strengthened by the coming of religious men from other parts of Germany. Within this colony the Moravian church was formally renewed by the introduction of the ancient discipline which Comenius had reprinted, and in the consecration of a new bishop by the hands of the two surviving bishops among the clergymen of the Reformed church. While the ancient church thus entered on a new life, as many persons of various views united with it from different parts of Germany, and as count Zinzendorf also had some peculiar opinions, the new development differed somewhat from the old. Count Zinzendorf having become the leading bishop, strove, in rebuilding the church, to interfere as little as possible with the national church, in communion with which he had been born. In carrying out his views he established on the continent of Europe, in Great Britain, and America, strictly Moravian settlements, where the vanity and irreligion of the world were to be shut out, a high standard of spiritual life was to be maintained, and only brethren were to hold real estate. These Moravian settlements were designed to be as leaven throughout Christendom. Among them a merely nominal profession of Christianity was not to be known; but all the inhabitants were to be sincere followers of Christ. This ideal was for a long time kept steadily in view, and with very great success. Besides these exclusive settlements they had in Great Britain and America some churches of a more general character. For a time fanaticism and extravagance threatened great injury to their settlements and churches in Europe; but the timely efforts of Zinzendorf and his helpers were successful in checking the evil. Their salutary influence extended far beyond their own bounds. They contributed greatly to increase John Wesley's power; imparted to Schleiermacher the love to Christ which gave character to his whole life; afforded places of refuge for true Christianity during the prevalence of German rationalism; educated in their schools large numbers of young persons belonging to other denominations; started a great home missionary work; and engaged with pre-eminent zeal in establishing missions in heathen lands. There are still 15 exclusively Moravian settlements on the continent of Europe, and four in Great Britain. In these the members are divided into seven classes called *choirs:* the married, the widowed, the unmarried men, the unmarried women, the boys, the girls, and little children. In each village there is a Brethren's house for the unmarried men, who live together and carry on trades; a Sisters' house, where the unmarried women have their homes and are supplied with work suited to them; and a Widows' home, where all of that class are provided, at moderate cost, with all things needed for their comfort, and where the poorest can live respectably. The spiritual affairs are under the superintendence of the Elders' conference, while financial and municipal matters are managed by the board of overseers. Until lately real estate could be held only by Moravians, but changes in this rule are in progress which will probably result in the entire abolition of the exclusive system.

III. *The Moravian Church in America.*—Moravian emigrants went to Georgia in 1735; but five years afterward, when troubles arose between that colony and Spain, they removed to Pennsylvania, where they built the towns of Bethlehem and Nazareth. These and some smaller settlements adopted the exclusive plan and even communism in labor. "The lands were the property of the church, and the farms and various departments of mechanical industry were stocked by it and worked for its benefit. In return the church provided the inhabitants with all the necessaries of life. Those however who had means of their own retained them. There was no common treasury." This system, which was called the "Economy," existed for 20 years, during which time it produced great results. Each member of it was pledged to devote his time and powers in whatever direction they could be best applied for the spread of the gospel. By this means there went forth a succession of missionaries through the colonies and among the Indians, preaching salvation by Christ, while the work at home of farmers and mechanics provided for their support. Though the Economy was of short duration, the exclusive foreign policy was continued 80 years. But toward the middle of the present century it was gradually modified, and has now been set aside. The Unitas Fratrum is divided into three provinces, the German, British, and American, which are independent in local affairs, but form one organization for the control of doctrine, discipline, ritual, and foreign missions. The provincial synods meet at fixed times, and provide for all matters of administration among themselves. At intervals of ten or twelve years the general synod of the whole body is held at Herrnhut in Saxony. It consists of nine delegates from each province, of delegates from the foreign missions, and of certain *ex officio* members. It elects a board of twelve bishops to oversee the whole church in general matters, and to superintend the foreign missions. At the last meeting of the general synod in 1879 the number of members reported from the various provinces was over 30,000, and of missionaries and their children 400. In all the provinces they have about 50 boarding-schools designed for young people not connected with the denomination, and containing annually about 2,500 pupils. The work of foreign missions was commenced almost simultaneously with the building of Herrnhut, and since that time about 2,500 missionaries have been sent out and sustained by the labor of the members remaining at home. At the present time they have missions in 17 provinces distributed over the world.

MORA'WA, river in Austria. See MARCH.

MORA WOOD, a dark timber from a Guiana tree, the *dimorphandra mora*, or *mora excelsa* of the order *leguminosæ*. It is brought to Europe for shipbuilding purpose.

MORAY, EARL OF, See MURRAY, *ante.*

MO'RAY FIRTH, and indentation of the German ocean, on the n.e. coast of Scotland. Its n.w. shore is formed by the counties of Ross and Cromarty, and extends from Kessock ferry, opposite Inverness, to Tarbet Ness. Its s.e. shore extends from Inverness to Burghead, in Elginshire. The entrance of the firth between Burghead and Tarbet Ness is 16 m. in width; and from its entrance to Inverness it is 31 m. in extent. The firth is continued westward from Inverness by a branch called Beauly basin.

MORAYSHIRE. See ELGINSHIRE.

MORAZAN', FRANCISCO, 1799-1842; b. in Honduras, his father being of Corsican descent. At an early age he began to be active in the troubled politics of Central America, and when but 25 years old was made secretary-general of Honduras; and soon after, having shown himself both a good soldier and a keen statesman, he was elected governor of the state. At that time the liberal party was in power, but constant insurrections were incited by the reactionary factions. These factions Morazan met with firm military measures, and in 1829 drove them out from the city of Guatemala, a service rewarded by the congress with the title of "saviour of the republic." From this time until 1832 he was commander-in-chief of the forces and intrusted with extraordinary powers. He used his authority in ridding the country of the curse of monasticism, abolished convents and tithes, and had the boldness to expel the archbishop of the diocese and other church dignitaries. In 1832 he repelled an invasion from Mexico headed by Arce, a former president, and consented to accept the presidency, which up to that time he had refused. But he had underrated the power of the church; the prevalence of the cholera gave the priests a pretense to inflame the minds of their most ignorant devotees, mostly Indians, with preposterous tales of poisoning and the "vengeance of heaven." A general rising took place, Morazan was overpowered, and, in 1840, compelled to flee to Chili. In 1842 he went to Costa Rica and was made governor without opposition. Still adhering to the idea of federation of the states of Central America he soon lost his popularity; again a sudden insurrection was incited and Morazan fell a victim, being court-martialed and shot on Sept. 15, the anniversary of the federation in 1823 of the five independent states.

MORBID APPETITES may consist of a desire which is, in character, natural and necessary to the animal economy, but becomes unhealthy when excessive and irresistible. Of this, the hunger which attends marasmus, and the thirst which attends diabetes, may be cited as illustrations. They may consist, further, in a craving for articles or objects not in reality deleterious or detrimental, but which do not constitute the ordinary gratification of the appetite, such as the desire for chalk and lime experienced by chlorotic and hysterical women. They may, thirdly, consist in the longings, often complicated with delusions, felt by pregnant women and others, which are injurious, repugnant to nature, and revolting. Georget gives an instance where a wife coveted the shoulder of her husband, killed him in order to obtain the morsel, and salted the body in order to prolong the hideous cannibalism. In such a case the gross longing may be said to constitute the disease; but there are others in which it is one of many symptoms demonstrating the degradation of the mind under general disease, as when the insane devour garbage, excrement, or swallow grass, hair, stones.—Georget, *Dict. de Médecine;* Feuchtersleben, p. 276.

MORBIHAN, a maritime department in the n.w. of France, formed out of ancient Bretagne. Area, 2,615 sq.m.; pop. '76, 506,573. The coast is much indented, and has a multitude of bays, roadsteads, harbors, and islands. The largest island is Belle isle (q.v.). The department has a somewhat hilly appearance, but towards the sea the land stretches out in rich plains, interrupted, however, by great tracts of heath and marsh. The climate is mild but moist. The soil is not well cultivated, but yields sufficient grain for home consumption. The heaths afford fine pasturage, and support great herds of horned cattle, sheep, and horses. The rearing of bees is a source of very considerable revenue; as also are the river and coast fisheries. The trade in sardines is particularly extensive. The want of wood is so great that the peasants are obliged to burn dung extensively. The chief mineral is iron, but there are almost no manufactures. Morbihan is divided into the four arrondissements of Vannes, L'Orient, Ploermel, and Pontivy. The chief town is Vannes (q.v.), but the most populous is L'Orient (q.v.).

MORDANTS. See DYEING.

MORDAUNT, CHARLES, Earl of Peterborough, military and naval commander, and one of the most brilliant Englishmen of his time, was the son of John, lord Mordaunt, and was born in 1658, some say 1662. He served as a boy in the navy, and then entered the army. He took part against James II., and was made earl of Monmouth by William III., succeeding afterwards to the earldom of Peterborough, as heir to his uncle. During the war of the Spanish succession the English government determined to send an expedition to Spain. It was placed under the command of Mordaunt, and in June, 1705, he arrived in Lisbon with 5,000 Dutch and English soldiers. After taking on board the archduke Charles of Austria, who claimed the Spanish crown, the armament proceeded to Valencia. Here Mordaunt, with characteristic daring, conceived the idea of making a dash at Madrid, and finishing the war at one blow. He was overruled by the archduke and the prince of Hesse, and compelled to besiege Barcelona, which was defended on one side by the sea, and on the other by the strong fortifications of Monjuich. By a *coup de main* he made himself master of Monjuich. Barcelona fell, and Mordaunt, with a handful of men, entered one of the strongest cities of Europe. He pushed his successes into the interior. Several towns submitted. He marched to Valencia in the depth of winter, and at the head of 1200 men defeated a Spanish force of 4,000. The Spaniards sent a large army into Catalonia, and a French fleet appeared off Barcelona. Mordaunt harassed the enemy's army, and putting himself on board the English squadron, directed a movement which, had it been executed a few hours earlier, would have resulted in the capture of the whole French fleet. The Frenchmen put to sea, and Barcelona was saved. Mordaunt again wished to march towards Madrid, but his plan for gaining possession of the capital was once more rejected by Charles. He accordingly left the army in a fit of pique, and went to Italy. In 1707 he returned to Valencia as a volunteer, and gave excellent advice, which was not followed. He was recalled to England, and from that moment the tide of fortune ran strong against the Austrian cause. Few generals have done so much with means so small, or displayed equal originality or boldness. His fertility and activity of mind were admirably seconded by a most intrepid spirit. His splendid talents, on the other hand, were disfigured by vainglory, and a morbid craving for novelty and excitement. He loved to fly round Europe, and was said to have seen more kings and postilions than any other man of his day. On his return he made common cause with the tories, to spite the duke of Marlborough, and received the garter and other dignities for his services. On the accession of George I. he was appointed commander-in-chief of the naval forces of Great Britain; He died at Lisbon, Oct. 25, 1735. His witty yet affectionate letters to Pope, Swift, Prior, etc., give a fine insight into his private character. See Eliot Warburton's *Memoir of Charles Mordaunt, Earl of Peterborough and Monmouth, with Selections from his Correspondence*, 2 vols. (1853). His character has been sketched by Horace Walpole, in his *Catalogue of Royal and Noble Authors*, and with still greater force and picturesqueness by Macaulay.

MORDECAI, ALFRED, b. N. C., 1800; graduated at West Point in 1823, and remained there the two following years as professor of philosophy, and engineering. In 1855 he was sent by the government to the Crimea as a member of the military commission, and his report was published by congress in 1860. Since 1862 he has been assistant engineer of the Mexico and Pacific railroad. He is the author of several technical works, the chief of which is an *Ordnance Manual.*

MORDVINS, a people in e. Russia, between the Oka and Volga rivers. They belong to the Volgaic division of the Finns. Their number is estimated at 400,000. A grammar of their language was published by Ahlquist at St. Petersburg, 1871.

MORE, HENRY, D.D., 1614–87; b. Grantham, Lincolnshire, Eng.; studied at Eton, where beside his regular studies he spent much time in reading the philosophical works of Aristotle and Julius Scaliger; entered Christ college, Cambridge, at the age of 17, and graduated in 1635. During all his college course he devoted himself with great zeal to philosophy, saying to some one, "I immersed myself over head and ears in the study of philosophy, promising a most wonderful happiness to myself in it." He found no rest to his mind in any system, but became more and more perplexed and skeptical, until he came to the writings of Plato and the Platonic writers, and "discovered the long-looked for treasure in the dreamy pages of Marsilius Ficinus, Plotinus and Trismegistus." In 1639 he took the degree of master of arts, and became tutor to several persons of distinction. He declined many important offers in the church, preferring a quiet life at Cambridge and the study of philosophy even to the honors of a bishopic at £1500 a year. He resigned the rectory of Ingoldsby in 1642, declined the mastership of his own college in 1654, and though he accepted a prebend in the church of Gloucester in 1675, he soon resigned it. In 1640 he published *Psychozoia or the First part of the Song of the Soul, containing a Christiano-Platonical display of life.* This was reprinted in 1647, and with some additional pieces under the title of the *Philosophical Poems.* His next work was *Conjectura Cabalistica,* and the *Philosophiæ Teutonicæ Censura,* at the request of Lady Conway, a noted disciple of William Penn. He secured her friendship, and received from her a legacy of £400, which he devoted to private charity. In 1671 he published *Enchiridium Metaphysicum*, in which he inveighed against Cartesianism. His other principal works are *Enchiridion Ethicum Metaphysicum; The Mystery of Iniquity; A Key to the Revelation; An Apology for Descartes; The Immortality of the Soul; Enthusiasmus Triumphatus; The Mystery of Godliness*, which for 20 years had a great sale. £300 were left by an admirer of his works to have some of More's pieces translated into Latin, which led the author to publish all his works in Latin in 3 folio vols. in 1679. His last work *Medela Mundi* he did not live to finish. The greater number of his works appeared in English under the title of *A Collection of several Philosophical Writings*, folio. *The Life of the Learned and Pious Dr. Henry More* was written by the Rev. Richard Ward. Though a mystical philosopher, he was a man of great intellectual power, profound learning, and rare excellence of character. He was one of the first fellows of the royal society, and was a correspondent of Descartes.

MORE, HANNAH, the daughter of a village schoolmaster, near Bristol, was b. in 1745. She wrote verse at an early age; and in 1773, she published a pastoral drama entitled *The Search after Happiness;* and the year after, her tragedy of *Regulus*. Under the idea that she was possessed of dramatic talent, she was introduced to Garrick, and through him became acquainted with Dr. Johnson, Burke, and sir Joshua Reynolds. Deeply impressed with the importance of religion, she gradually resigned her ambition to shine as a writer for the stage. and after the publication of her *Sacred Dramas*, she retired to the country, and busied herself with the composition of works of a more serious and practical cast, the best remembered of which are, *Cœlebs in Search of a Wife*, and *The Shepherd of Salisbury Plain*. She died at Clifton, on Sept. 7, 1833. Her *Memoirs and Correspondence* were published in the following year, in 4 volumes.

MORE, Sir THOMAS, lord chancellor, and one of England's worthiest sons, was b. in Milk street, London, in 1478, son of sir John More, justice of the queen's bench. He was educated at St. Anthony's school, Threadneedle street; and in his fifteenth year was placed in the house of cardinal Morton, archbishop of Canterbury, who used to say of him: "This child here waiting at the table, whosoever shall live to see it, will prove a marvelous man." Dean Colet, too, was wont to say: "There was but one wit in England, and that was young Thomas More." In 1497 More went to Oxford, where he made the friendship of Erasmus. He then applied himself to the law, and studied first at New Inn, and afterwards at Lincoln's Inn. He was appointed reader at Furnival's Inn, where he lectured for three years. At the accession of Henry VIII., his professional practice was considerable, and he also held the office of judge of the Sheriff's court in the city—his income from these sources being equivalent to £4,000 or £5,000 of our present money. He went on several missions abroad for the king, and in 1516 was made a privy-councilor. His public life now began. He became so great a favorite with Henry VIII., that, in the words of Erasmus, "the king would scarcely ever suffer the philosopher to quit him." Henry visited him uninvited at Chelsea, and walked with him by the hour in his garden, "holding his arm about his neck." Yet More had a true insight into Henry's character, for being congratulated on the king's favor by his son-in-law, Roper, he replied: "If my head would win him a castle in France, when there was war between us, it should not fail to go." More is the first person in British history distinguished by the faculty of public speaking, and remarkable for the successful employment of it in parliament against a lavish grant of money to the crown. Being elected speaker of the house of commons in 1523, he vindicated the ancient liberties and privileges of the house against cardinal Wolsey, who rather feared than liked him. In 1529, when the prosecution was opened against Wolsey, the king delivered the great seal to More at Greenwich, constituting him lord chancellor, a dignity that had generally been held by ecclesiastics, and had never yet been filled by a common lawyer. When he was seated in his court of chancery, his father, sir John More, who was nearly ninety, was the oldest judge of the King's bench. It was a beautiful spectacle to "see the son ask the blessing of the father every day upon his knees, before he sat upon his own seat." Unlike the haughty Wolsey, whom no suitor would approach without offerings, More sat daily in an open hall, that he might receive in person the petitions of the poor. He dispatched the causes so speedily and diligently, that on asking for the next, he was told that none remained. Henry in vain endeavored to obtain More's authority for his divorce with Catharine of Aragon, and his marriage with Anne Boleyn, upon which he had set his heart. As soon as the progress of the marriage was so far advanced that the active co-operation of a chancellor was required, More obtained leave to resign the great seal. When the king "by no gentleness could win him," his favor turned to fury. More refused to take an oath which pledged him to the lawfulness of the king's marriage with Anne Boleyn. He was committed to the Tower, where he remained thirteen months. On May 6, 1535, he was brought to trial at Westminster. It has been truly said that "no such culprit had stood at any European bar for a thousand years." He was convicted by the most flagrant perjury and injustice, and sentenced to the savage punishment for high treason. He suffered death in the Tower, July 6, 1535. In the words of Addison: "The innocent mirth which had been so conspicuous in his life did not forsake him to the last." When he laid his head on the block, he desired the executioner to wait until he had removed his beard, "for that had never offended his highness." His head was placed on London bridge, but was taken down and preserved by his favorite daughter, the admirable Margaret Roper, the story of whose tenderness and devotion will live as long as the English language endures. His *Utopia* is the conception of an imaginary commonwealth, in which opinions are expressed of great boldness and originality, and especially favorable to freedom of inquiry, even in religion. He, however, wrote against the Lutherans, and corrected the MS. of Henry's answer to Luther. The terseness and liveliness of his sayings, his sweet temper and affectionate disposition, his blameless life, his learning and probity, combine to make a union of perfect simplicity with moral and intellectual greatness, which will for ever endear his memory to his countrymen of every sect and party.

MORE'A, the name borne by the ancient Peloponnesus (q.v.) since the middle ages, if not from as early a period as the 4th century. It is usually said to be derived from *morus*, a mulberry—the outline of the peninsula bearing a resemblance to the leaf of that tree; others, however, such as Fallmerayer, trace it back to the Slavic word *more*, the sea, which nearly encircles the Morea. The Morea forms the most southern part of the kingdom of Greece, and is divided into the nomarchies of Argolis, Corinth, Laconia, Messenia, Arcadia, Achaia, and Elis.

Overrun by the Goths and Vandals, it became a prey, in the second half of the 8th c., to bands of Slavic invaders, who found it wasted by war and pestilence. Gradually, however, these barbarians were subdued and Grecianized by the Byzantine emperors. Nevertheless, the numerous names of places, rivers, etc., in the Morea of Slavic origin, prove how firmly they had rooted themselves, and that the Moreotes are anything but pure Greeks. In 1207 the peninsula was conquered by French knights, and Achaia was formed into a principality with all the feudal institutions of the west. After 1261 the Byzantine emperor, Michael VIII. Palæologus, reconquered part of the country; but the principality of Achaia remained in the family of Villehardouin till 1346, when the male line became extinct. Various claimants now arose, and much strife and confusion ensued. At length, in 1460, the greater portion of the Morea fell into the hands of the Turks, who retained possession of it down to the period of the Greek revolution, except from 1687 to 1715, when it was held by the Venetians. The long struggle between the Turks and Venetians diminished the population so much that in 1719 it had only 200,000 inhabitants, and the plagues of 1756 and 1782 even reduced it to half this number. After the French revolution, however, it began to increase; at the outbreak of the war of independence, in 1827, it had reached 300,000, of whom only one-sixth were Turks; and in 1870 it was 645,389.

MOREAU, Jean Victor, the greatest general of the French republic, except Bonaparte, was born Aug. 11, 1763, at Morlaix, in Bretagne; was the son of an advocate, and was sent to study law at Rennes. He took the side of the revolution, was chosen to command the battalion of volunteers from Rennes, served under Dumouriez in 1793, and displayed such military talent, that in 1794 he was made a general of division. His father was put to death by the guillotine under the reign of terror, and Moreau hesitated for a moment, but resolved that he could not withdraw from the service of his country. When Pichegru fell under suspicion, the directory appointed Moreau, in the spring of 1796, to the chief command on the Rhine and Moselle. He crossed the Rhine at Kehl, defeated Latour at Rastadt, and the archduke Charles at Ettlingen, and drove the Austrians back to the Danube. But, owing to errors in the plan of the campaign, against which he had in vain remonstrated with the directory, Moreau found himself in danger of being cut off from the Rhine, and was obliged to make a desperate effort to regain that river, which he accomplished, notwithstanding great difficulties, by a march of forty days. This retreat established his reputation for generalship more than all his previous victories.

A suspicion of participation in the plots of Pichegru led to his being deprived of his command, after the *coup d'état* of 18th Fructidor. In the following year he succeeded Schérer in the command of the army in Italy, when it was hard pressed by the Russians and Austrians, 25,000 men being opposed to 80,000. By a retreat conducted with consummate skill, and in course of which he even gained victories, he saved the French army from destruction. The directory, nevertheless, deprived him of the chief command, and gave it to Joubert. But Moreau remained with the army, and aided that young general to the utmost; and after his death at Novi, again assumed the command, and conducted the defeated troops to France. The noble disinterestedness of Moreau's character, his military talent, and his political moderation, induced the party which overthrew the directory, to offer him the dictatorship of France, which he declined, and lent his assistance to Bonaparte on 18th Brumaire. Receiving the command of the army of the Rhine, Moreau gained victory after victory over the Austrians in the campaign of 1800, and at last won the great and decisive battle of Hohenlinden (q.v.). A strong feeling of mutual distrust now arose between Moreau and Bonaparte, who sought in vain to win him to himself; and Moreau's country-seat, to which he retired, became the gathering-place of the discontented. Bonaparte surrounded him with spies, and ere long he was accused of participation in the plot of Cadoudal (q.v.) and Pichegru against the life of the first consul. He was arrested, brought to trial, and found guilty on 10th June, 1804, although the evidence against him was utterly insufficient. But Bonaparte could not venture upon a sentence of death, and a sentence of two years' imprisonment was therefore pronounced, which was commuted into banishment, and Moreau went to America, where he settled in New Jersey. Regarding with great dissatisfaction the whole of Bonaparte's further career, he thought it his duty to France to give his aid to the allies in the campaign of 1813, and leaving the United States in the company of a Russian agent, he landed at Gothenburg, had an interview with the crown prince of Sweden, the former gen. Bernadotte, and accompanied the emperor of Russia and the king of Prussia in the march against Dresden, where, as he stood with the emperor Alexander on a height at Raecknitz, on Aug. 27, a French cannon-ball broke both his legs. Amputation was performed, but he died at Laun in Bohemia, Sept. 2, 1813.

MOREAU DE SAINT MÉRY, Médéric Louis Élie, 1750–1819; b. in the isle of Martinique; educated in Paris; commenced life as an advocate, and not long after returned to his native island to practice his profession; amassed a fortune, and was charged by the French government to prepare a civil code for the French islands, which was published under the title, *Lois et constitutions des colonies francaises de l'Amerique, de 1550 à 1785.* Named president of the electors of Paris in July, 1789; member of the constituent assembly for Martinique in 1790; a refugee to the United States, after the dominance of the Jacobins in Paris; there became a bookseller; was called to Bonaparte's council of state in 1800; administrator of the states of Parma, Plaisance, and Guastalla, in 1802, and there fell into disgrace for lack of energy against a militia revolt. In 1806 he was granted an audience by Napoleon, and said to him: "Sire, I do not ask to be recompensed for my probity, I ask only for its toleration." He became very poor afterward, until 1817, when Louis XVIII. granted him a handsome pension. His published works are *Description de la partie espagnole de Saint Dominique* and *Description de la partie française de Saint Dominique,* both published in Philadelphia in 1796–97–98.

MORE'CAMBEBAY, an inlet of the Irish sea, on the n.w. coast of England, separates the main portion of Lancashire from the detached portion of Furness. It is about 10 m. in average breadth, and is 16 m. in length. It receives the Kent, the Keer, and the Lune. The depth of water in the bay is never great except in the channels of the rivers; and when the tide is out, the water entirely withdraws for the time, and there is a road, although a dangerous one, across the sands from the vicinity of Lancaster into Furness.

MOREEN. See Moire.

MOREHEAD, James T., 1797-1854; b. Ky.; educated at the Transylvania university, and admitted to the bar. He served a number of terms in the legislature and was elected lieutenant-governor in 1832. He was governor 1834–36, and U. S. senator from Kentucky 1841–47. He published in 1846 a work on *Practice and Proceedings at Law.*

MOREHOUSE, a parish in n. Louisiana, adjoining Arkansas, bounded on the s.e. by the Bœuf Bayou river, on the w. by the Ouachita river, and drained by the Bœuf bayou and Bartholomew bayou; pop. '80, 14,206—14,111 of American birth, 10,662 colored. The surface is undulating, and heavily wooded with oak, pine, cypress, and other trees. The soil is rich; the principal productions are Indian corn, cotton, and sweet-potatoes. Capital, Bastrop.

MOREL, *Morchella,* a genus of fungi, of the division *hymenomycetes,* having a fistular stalk, and a roundish or conical *pileus,* the upper surface of which is divided into an irregular net-work of cells or pits, and bears the *hymenium.* They grow on the ground, and have a more or less agreeable smell and taste. Some of them are reckoned among esculent fungi, of which the best-known is the Common Morel (*M. esculenta*), a fungus rare in Britain, but common in many parts of the middle and south of Europe. Its stalk is only about an inch high, and it has a roundish, oval, oblong, or conical, yellowish or brown pileus. It is nutritious, and not difficult of digestion; but is chiefly used in sauces and gravies, on account of its pleasant flavor. It is used either fresh or dried, and is often brought to market in a dried state. It grows in lawns, and among fallen leaves in the thinner parts of woods where the soil is light, and makes its appearance in spring. It makes excellent catchup. In Germany the morel is highly prized, and as it very often springs up when part of a forest has been burned, the forests of Germany were often destroyed for its sake, till this practice was restrained by severe penalties. Its cultivation has not been attempted, although probably it would not be difficult.—A very similar species is *M. patula,* which is used in the same way; as is also the Bohemian Morel (*M. Bohemica*), which has a stem 4 to 8 in. high, and thimble-shaped, obtuse, white-margined pileus, with longish narrow pits of many various forms; abundant in Bohemia, and, when dried in a baker's oven, a considerable article of export. The name morel (*morchel*) is extended in Germany to some of the edible species of *helvella* (q.v.).

MORELL', John D., b. England, 1815; studied philosophy, upon which he has written a number of books. His *Historical and Critical View of the Speculative Philosophy of Europe* appeared in 1846; *Philosophy of Religion,* 1849; and *Elements of Psychology,* 1853.

MORE'LIA, or Valladolid, a t. of Mexico, capital of the state of Michoacan, in a fine valley, surrounded by high mountains, 125 m. w.n.w. of Mexico. There is a magnificent aqueduct for the supply of water. It was the birthplace of Iturbide, the short-lived emperor of Mexico. Pop. 25,000.

MOREL'LA (anc. *Castra Ælia*, the winter-quarters of Sertorius), a t. and important fortress of Spain, in the province of Castellon, about 80 m. n. of Valencia. Morella was the chief stronghold of Cabrera, who scaled the castle by ropes furnished by a partisan within, on the night of Jan. 25, 1838. It was retaken in 1840 by Espartero, after a brave defense. There are some interesting Roman and Moorish antiquities. Pop. 6,300.

MORE'LOS Y PARON, José Maria, 1780–1815; b. in New Mexico; curate of a village in Valladolid. The insurrection against Spanish rule was headed by Hidalgo, and to this movement Morelos joined himself in 1810, and received a commission as capt.gen. of the s.w. provinces. His first great exploit was the capture of Acapulco, where a large body of regular troops was surprised and routed by a few hundred insurgents, mostly negroes. This victory was preceded and followed by many gallant and well-planned movements; but when in 1813 he determined on the attack of Valladolid, contrary to the advice of his next in command, Matamoros (q.v.), he undertook a task beyond his strength. There, after a fierce contest, his forces were routed, and after sustaining for some time an unequal struggle, he was captured, tried, and put to death.

MORESQUE. See Arabesque, Grotesque.

MORE'TO Y CABA'NA, Agustin, 1600–69; b. Spain. Little is known of his life. He wrote many plays, some religious, as *The Most Fortunate Brothers;* or heroic, like *The Brave Justiciary of Castile;* but the majority, "comedies of cloak and sword," in the old Spanish manner. His best drama, *Disdain met with Disdain*, is founded on Lope's *Miracles of Contempt*, and was in its turn imitated by Molière in the *Princesse d'Elide*. The Don Diego of his play of that name has become the Spanish type and synonym for a coxcomb.

MO'RETON BAY, on the e. coast of Queensland, Australia, is formed inside the islands of Moreton and Stradbroke, the former 23 m., and the latter 35 m. in length, and both about 5 m. in greatest breadth. It is 65 m. in length (lat. 27° to 27° 55' s.) by 23 m. in greatest breadth. Its shores are rich in soil, and admirably adapted for agriculture Its appearance is rendered picturesque and beautiful by the numerous islets, some of them capable of profitable cultivation, with which it is dotted over. Into this bay 5 navigable rivers, the Arrowsmith, Logan, Brisbane, Pine, and Caboolture, pour their waters. The entrance at the n. end is practicable at all times for vessels of the largest size; the entrance between Moreton and Stradbroke is narrow, and less safe.

MORETON-BAY CHESTNUT, *Castanospermum Australe*, a tree of the natural order *leguminosæ*, sub-order *papilionaceæ*, a native of Queensland, Australia. It attains a height of 70 to 100 ft., has wide-spreading branches, pinnate leaves, and large racemes of beautiful red and yellow flowers. The pods are 6 or 7 in. in length, and the seeds are in size and quality somewhat like chestnuts.

MOREY FORGERY, an event of the presidential campaign of 1880, when James A. Garfield, the republican candidate for president, was charged with having written a letter favoring Chinese immigration in the interest of a supply of cheap laborers. The letter, purporting to be addressed to "H. L. Morey, Lynn, Mass.," was made public in a New York paper, Oct. 20, 1880; and on the 22d what purported to be a fac-simile in lithograph or photo-engraving process from the original letter, was published in the same paper. On Oct. 23 Mr. Garfield, in two letters from Ohio, which were promptly made public, denounced the letter to Morey as "a bold forgery both in its language and sentiment;" and denied that he had ever heard of the existence of such a person as H. L. Morey. The managers of the democratic campaign refused credence to Mr. Garfield's denial, and circulated an immense number of copies of the original "letter;" producing a profound impression throughout the country, particularly on the Pacific coast. There is reason to believe that the "letter," now conceded to have been a forgery by some hand undisclosed as yet (Mar., 1881), turned the vote of California in favor of the democratic candidate for the presidency.

MORGAGNI, Giovanni Battista, 1682–1771; b. Italy; studied medicine at Bologna, and physics and comparative anatomy at Padua and Venice. In 1706 he published *Adversaria Anatomica*, a treatise of marked originality, and 6 years later he was appointed professor of the theory of physic at Padua. In 1719 he published complete his collection of *Epistolæ Anatomicæ*, containing his observations for many years. His great work, *De Sedibus et Causis Morborum per Anatomen Indagatis*, which appeared in 1761, is still an authority on pathology. Morgagni was a man of vast learning in other branches, and in medicine he performed much the same service for pathology that Haller did for physiology.

MORGAN, a co. in n. Alabama, s. of the Tennessee river; 720 sq.m.; pop. 12,187—12,082 of American birth. The surface is irregular and mountainous. The soil in most portions is rich, and good crops of Indian corn, cotton, sweet potatoes, and oats are grown. Considerable molasses is made from sorghum. A portion is watered by Flint river. It is on the Memphis and Charleston, and South and North Alabama railroads. Co. seat, Somerville.

MORGAN, a co. in n. central Georgia, drained by the Appalache and Oconee rivers and their branches; 450 sq.m.; pop. '80, 14,034—9,788 colored; intersected by the Georgia railroad. The surface is level or undulating, partly covered with forests and very fertile. Cotton, corn, and sweet potatoes are the staples. Limestone and granite are found; there are several saw-mills and tanneries.

MORGAN, a co. in w. Illinois, s.e. of the Illinois river; 550 sq.m.; pop. '70, 28,463—23,805 of American birth. It is mostly prairie, with occasional small tracts of timber. The soil is deep and rich, and produces immense quantities of corn, the annual production of which amounts to millions of bushels. Wheat and oats are also grown in abundance. There are large numbers of sheep, and wool-growing is cultivated with success. The chief manufacture is carriages; next in importance are agricultural tools, and machinery, flour, harnesses, and furniture. The Wabash, Chicago and Alton, Rock Island, Rockford and Peoria, Pekin and Jacksonville railroads pass through it. Co. seat, Jacksonville.

MORGAN, a co. in central Indiana; 453 sq.m.; pop. '80, 18,899—18,602 of American birth. The surface is level in the n., but more irregular in the south. The soil is rich, and produces immense quantities of Indian corn, besides wheat, oats, tobacco, and potatoes. There are large numbers of cattle, and wool is exported. The White river and Mill and White Lick creeks flow through it. There is a heavy growth of timber. The Indianapolis and Vincennes, and Fairland, Frankland and Martinsville railroads cross it. Co. seat, Martinsville.

MORGAN, a co. in n.e. Kentucky, having a range of the Alleghany mountains for its e. boundary, drained by the Licking river, forming a part of its n.w. border; 330 sq.m.: pop. '80, 8,455—8,451 of American birth, 33 colored. Its surface is rough and hilly, a large proportion covered with forests of beech, cedar, hemlock, laurel, holly, etc. Its mineral products are iron, bituminous coal, alum and copperas, and oil springs appear in some sections. Its valleys are fertile, producing grain, potatoes, tobacco, wool, and dairy products. Some attention is paid to stock raising. Co. seat, West Liberty.

MORGAN, a co. in central Missouri; 600 sq.m.; pop. '80, 10,134—9,399 of American birth. The surface is uneven and hilly, and the soil fertile. The chief products are Indian corn, wheat, and oats. Pork and cattle are also staples. Bituminous coal, lead, and limestone are found. The county is drained by the Osage and Lamine river. There are extensive forests of elm, wild cherry, oak, hickory, and ash. The Missouri Pacific railroad runs along the n. border. Co. seat, Versailles.

MORGAN, a co. in s.e. Ohio, on both sides of the Muskingum river; 360 sq.m.; pop. '80, 20,074—341 foreign. The surface is uneven and diversified. The soil is fertile, and the principal crops are corn, wheat, tobacco, oats, and potatoes. The growing of wool is an important industry. There are extensive deposits of salt. There are a number of flour mills, tanneries, currying shops, salt manufactories, and carriage shops. Co. seat, McConnellsville.

MORGAN, a co. in n.e. Tennessee, watered by Emery and Obie's rivers; 640 sq.m.; pop. '80, 5,156—286 colored. The surface is irregular and mountainous, belonging to the Cumberland table-land. Much of it is covered with a heavy growth of oak, pine, and chestnut. There are extensive deposits of bituminous coal. The staples are Indian corn, oats, grass, tobacco, and butter. It is on the Cincinnati Southern railroad. Co. seat, Wartburg.

MORGAN, a co. in n.e. Utah; 600 sq.m.; pop. '80, 9,266—8,243 of American birth. The surface is irregular and mountainous. The soil is not largely cultivated, but produces some barley and wheat. Gold is found in paying quantities, and coal and iron are known to exist. The Union Pacific railroad passes through it. Co. seat, Morgan.

MORGAN, a co. in West Va., on the Baltimore and Ohio railroad and the Potomac river; 375 sq.m.; pop. '70, 4,315. Large deposits of coal and iron are found within its boundaries. Co. seat, Bath.

MORGAN, CHARLES W., 1790–1853; b. Va.; entered the navy at an early age, and was one of the officers of the ship *Constitution* at the time of the engagement with the men-of-war *Guerrière* and *Java* in 1812, when he rendered such conspicuous service that the legislature of Virginia, in recognition of it, presented to him a sword. From 1841 to 1843 he commanded the Mediterranean squadron. He was a nephew of Daniel Morgan, a brig.gen. in the revolutionary war.

MORGAN, DANIEL, 1737–1802; b. N. J. When 17 years old he emigrated to Virginia, where he worked as a farmer for some years. Next, he shared in the perils of Braddock's expedition against the Indians, probably as a wagoner, and received a wound in his neck and face that greatly disfigured him. It is stated, also, that during this campaign he was unjustly punished by 500 lashes for some fancied indignity to an officer. At the breaking out of the revolution he was given the command of 75 men enlisted in his neighborhood, with whom he rode to Boston, a distance of 600 m., to join the main army, where he was detached in the expedition against Quebec. In the attack on that city he distinguished himself by bravery and courage, but he was finally taken prisoner. After being exchanged he was appointed col. of a Virginia regiment, and further promotion rapidly followed. In 1780 he received a brig.gen.'s commission; was attached to the army in the south; and won the memorable victory at Cowpens over Tarleton, for which congress awarded him a gold medal. Shortly afterwards ill-health obliged him to retire to his farm, and he did not become conspicuous again until the "whisky insurrection" in Pennsylvania in 1794, when he commanded the Virginia militia against it. After this he was a member of congress from Virginia one term. Died at Winchester, Va.

MORGAN, EDWIN DENNISON, b. Mass., 1811. He received a common school education, and when about 17 entered a business firm at Hartford, Conn., and in 1831 became a partner. In 1836 he started a wholesale business in the city of New York, and soon acquired a large fortune. He served as a state senator 1849-53; was afterwards chairman of the republican committee, and in 1859 was elected governor of New York and served two terms, 1859-63. His administration was marked by the introduction of several local reforms, the reduction of the state debt, and improved management of the canals; he also displayed great vigor in assisting the general government at the outbreak of the civil war, and was given the rank of maj.gen. of volunteers. At the end of his term of office he was elected U. S. senator. In 1864 President Lincoln offered him the position of secretary of the treasury, but the honor was declined. Since that time he has remained in New York, conducting his extensive business, but taking great interest in politics. In 1876 he was again the republican candidate for governor, but was defeated by Lucius Robinson. He has presented the sum of $100,000 to the Union theological seminary, of New York.

MORGAN, GEORGE WASHINGTON, b. Penn., 1820; after serving in the Texan war for independence in 1836, he entered West Point, but left without graduating, and took up the study of law. On the outbreak of the Mexican war, he raised a regiment of Ohio volunteers, attached to the command of gen. Taylor. In 1847 he was made col. in the regular army, and served under gen. Scott in command of the 15th U. S. infantry. For gallantry at Contreras and Churubusco, he was brevetted brig.gen. He was appointed U. S. consul at Marseilles in 1855, and minister to Portugal in 1858. In the war of the rebellion, he commanded divisions in the army of the Ohio and the army of the Tennessee, but resigned, on account of ill health, in 1863. He was a member of congress from Ohio from 1871 to 1875.

MORGAN, Sir HENRY JOHN, about 1635-90; Welsh descent; trained to the sea and for some time served under Mansfield, at whose death he assumed command of a fleet of twelve ships, and as an English buccaneer preyed on the commerce of the West Indies. He carried Portobello by assault, in 1669 retired to Jamaica with a large fortune, but in 1670 again took command of a large fleet and ravaged the coast of Nicaragua. The next year he marched upon the city of Panama, and with less than 1500 men captured and burned the city. Peace having been made, he visited England, was knighted by Charles II., and appointed governor of Jamaica, where he died.

MORGAN, JAMES D., b. Mass. 1810; in boyhood shipped in the *Beverley*, and barely escaped with his life, as the crew mutinied and the ship was burned. The boat in which he escaped reached the South American coast, and Morgan endured many privations and hardships in returning home. He served as captain in the Mexican war; when the rebellion broke out was commissioned lieut.col. of the 7th Illinois volunteers, distinguished himself at New Madrid and Corinth, and in 1862 was made a brig.gen, and served in the Tennessee campaign, afterwards commanding a division of the 14th corps in Sherman's march to the sea.

MORGAN, JOHN H., 1826-64; b. Ala.; settled in the vicinity of Lexington, Ky., in 1830 He was engaged in the war with Mexico, holding a commission of 1st lieut. in Marshall's cavalry, and was present at the battle of Buena Vista. He was afterwards in business in Lexington, manufacturing bagging, but in 1861 attached himself to Buckner's army, being in command of the Lexington rifles, which he afterwards left, and commanded a squadron of cavalry at the battle of Shiloh He however, left the regular confederate service and engaged in guerrilla warfare on his own account, with a band of adventurers, who made the name of "Morgan's raiders" remembered with terror wherever they appeared. The extraordinary celerity and success of his movements gave him a high and peculiar military reputation, seriously modified by the utterly irregular character of his modes of warfare. Following close after the union armies, he destroyed military stores, burned railroad trains, tore up tracks, demolished bridges, and generally harassed and despoiled the enemy after a fashion of his own. He was even sufficiently enterprising and ingenious to keep a telegraph-operator with him in his movements, by whose aid he was enabled to spread false intelligence concerning them, and also obtain constant information with regard to the attempts which were being made to interfere with his rapid operations. He was finally captured, with nearly his whole command, while making a bold raid through Kentucky, Indiana, and Ohio. He was imprisoned in the Ohio penitentiary, but succeeded in escaping, and fled into Tennessee, where he soon after organized another raid, which proved to be his last. He was betrayed and captured by federal cavalry at a farm-house, where he was stopping, in Greenville, Tenn., and killed while seeking to escape.

MORGAN, Lady (SYDNEY), was the daughter of a theatrical manager, named Owenson, who settled in Dublin. It is usually stated that she was born in 1786, but as she refuses to tell the date of her birth, "because dates are so cold, false, and erroneous," the reader of her autobiography will do well to add about ten years to her age. Her father fell into pecuniary difficulties, and the clever, bold, and lively young woman resolved to support the fortunes of the family, first as governess, and then as author. She wrote *The Wild Irish Girl* in 1806. A lady novelist was then rare, and Irish subjects were less hackneyed than they have since become. Sydney Owenson obtained a footing in the household of the marquis of Abercorn, in whose establishment her future husband, Dr. Morgan, held the post of private physician. The lord lieutenant was persuaded to make a knight of Dr. Morgan, and the newly wedded pair set up for themselves in Dublin. Here she wrote the *O'Donnel.* The opening of the continent in 1814 attracted the Morgans to Paris. Lady Morgan obtained admission into the highest society, corresponded with several celebrities, and wrote a work on *France,* which was eagerly received and vehemently praised and censured by critics of different political opinions. In 1818 the Morgans went to Italy—the wife to sketch manners, scenery, and society, while sir Charles was to contribute chapters on politics, science, and education. Lady Morgan was received with great hospitality by the Italian nobility and the foreign visitors at Rome. Her *Italy* appeared in 1821, and proved one of the most successful and remunerative of her works. In 1824 the Morgans came to London, and in 1825 lady Morgan began to keep a diary, which contains some amusing bits of literary, fashionable, and political gossip. Her reputation as an authoress became obscured, but she continued to the end of her career to assume the twofold character of the lady of fashion and the woman of genius. She succeeded in obtaining from the Whig government a pension of £300 a year, in acknowledgment of her literary merits, and partly, also, in recognition of the unjust and virulent attacks to which she had been subjected for having, in her earlier works, exposed the wrongs of her native country. She died in 1859, having continued busy with her pen and her tongue to the last; and leaving behind a great mass of correspondence of little intrinsic value and interest, which, with a memoir, her autobiography, and diary, was published in 1862, in 2 vols. Her descriptions of high life have much raciness and vigor, and her Irish sketches—the famous "Jug-day," in *The O'Briens and the O'Flahertys,* deserving special mention—are perhaps the best account of that rackety, humorous, sentimental existence which was at once the charm and bane of Ireland, and which has but lately passed away.

MORGAN, Lewis Henry, b. N. Y., 1818; educated at Union college, and admitted to the bar. He began the practice of law at Rochester, in 1844, and retired in 1864. He is one of the first authorities on ethnology and anthropology. In 1851 appeared his *League of the Iroquois,* a study of the customs and institutions of the six nations. His investigations were particularly directed to the systems of family relationship prevailing among savage tribes; and in pursuit of his inquiries, he addressed letters to missionaries and U. S. consuls residing in the vicinity of barbarous nations. By this means he collected a large body of information, which is contained in his *Systems of Consanguinity and Affinity of the Human Family,* which was published by the Smithsonian institution in 1870. Some of the theories advanced in this work have met with considerable opposition from students of anthropology; as, for instance, from Mr. McLennan in his well-known book on *Primitive Marriage.* But the value of Mr. Morgan's researches as to facts has been universally recognized. In 1868 he published a work on *The American Beaver,* containing the results of his personal observations near lake Superior. Mr. Morgan has been a member of both branches of the N. Y. legislature.

MORGAN, Sir Thomas Charles, 1783-1843, b. England; educated at Eton and Cambridge. He took a medical degree in 1809, and began the practice of his profession in London. He was knighted in 1811, and soon afterwards established himself in Ireland, where, after giving up his practice, he devoted himself to literature and to the promotion of Roman Catholic emancipation. He published *Sketches of the Philosophy of Life; The Philosophy of Morals;* and with lady Morgan, *The Book Without a Name.*

MORGAN, William. See Anti-Masons.

MORGAN, William F., s.t.d., b. in 1818 at Hartford, Conn.; graduated at Union college, N. Y., and at the Episcopal theological seminary in New York. For more than twenty years he has been rector of St. Thomas's church in New York, holding high place among the clergy of his denomination as a writer and preacher. A collection of his sermons has been published.

MORGANATIC MARRIAGE (Goth. *morgjan,* to curtail, limit), sometimes called *left-handed marriage,* a lower sort of matrimonial union, which, as a civil engagement, is completely binding, but fails to confer on the wife the title or fortune of her husband, and on the children the full status of legitimacy or right of succession. The members of the German princely houses have for centuries been in the practice of entering into marriages of this kind with their inferiors in rank. Out of this usage has gradually sprung a code of matrimonial law, by which the union of princes with persons of lower rank, in other than morganatic form, involves serious consequences, especially towards the lady. The penality of death was actually enforced in the case of the beautiful and unfortunate Agnes Bernauer (q v.). In the 16th and 17th centuries, a fashion began among German princes of taking a morganatic wife in addition to one who enjoyed the complete matrimonial status—landgrave Philip of Hesse setting the example, with a very qualified disapprobation on the part of the leading Reformers. An energetic attempt was made in the first half of the last c. by Anton Ulrich, duke of Saxe-Meiningen, to upset the established practice, and obtain for his morganatic wife the rank of duchess, and for her children the right of succession. In deference to the united opposition of the whole princedom of Germany, the emperor refused the duke's suit, declaring that there could be no marriage in princely families without "ebenbürtigkeit," or equality of birth. In the present c. morganatic marriages are by no means on the decline among the German reigning houses—one of the best known and most remarkable instances being the union of the late Archduke John, the "reichsverweser" of 1848, with the daughter of the postmaster of Aussee, in Styria, afterwards created countess of Meran. Morganatic marriages are recognized not only among the princely families, but among the higher aristocracy of the empire; and in Prussia even the "niedere adel," or inferior gentry, may contract unions of this kind. A sort of left-handed or "hand-fasted" marriage was recognized in early times in the Highlands of Scotland, and Ireland: the hand-fasted bride could be put away, and a fresh union formed, with the full status of matrimony. Unlike the case of German morganatic marriages, the issue were often accounted legitimate, even to the prejudice of the children of the more regular union that followed. The Royal Marriage act, 12 Geo. III. c. 11, reduces to a position somewhat like that of morganatic unions every marriage in the royal family of Great Britain not previously approved by the sovereign under the great seal, provided the prince entering into it is under 25, and every such marriage of a prince above 25 which is disapproved by parliament.

MORGAR'TEN, a mountain slope on the e. margin of lake Egeri, in the canton of Zug, Switzerland, has acquired a world-wide celebrity as the scene of a great victory won by the Swiss forest cantons over the Austrians Nov. 15, 1315. The Swiss, who had command both of the narrow pass which wound between Morgarten hill and the lake, and of the adjoining heights, numbered only 1400 men, while the Austrians amounted to 15,000, and were led by duke Leopold, brother of the German emperor. When the Austrian troops had fairly entered the pass, those of the Swiss posted on the rocks above hurled down great masses of stone, which threw the enemy's cavalry into confusion, besides killing immense numbers of them. Their comrades who held the pass, taking advantage of the disorder, now charged the Austrians repeatedly, and utterly routed them. Only a few escaped, among whom was duke Leopold himself.

MORGENSTERN, CHRISTIAN, 1805–67; b. Germany; studied painting in the school of Bendisen. He afterwards studied at the Copenhagen academy of fine arts, and in 1830 took up his residence in Munich, where his first exhibited picture was "The Heath of Lüneburg." He exhibited a picture on the same subject at Paris many years afterwards. He was a good landscape painter, and also an etcher of merit. His best pictures are studies from the scenery of Heligoland.

MORGHEN, RAPHAEL SANZIO CAVALIERE, a famous engraver, was b. at Florence, June 19, 1758. His first instructor in the art of engraving was his father, who, according to some, was a German or the son of a German. The indications of talent that he gave were such as to induce his father to place him under Volpato at Rome. His progress then became very marked. Raphael's celebrated figures in the Vatican of "Poetry" and "Theology" were engraved by him in 1781; and he afterwards produced a succession of engravings of a very high class from many of the masterpieces of art: amongst these may be enumerated his prints from Raphael's "Madonna della Seggiola;" the "Madonna del Sacco," by Andrea del Sarto; the "Transfiguration," by Raphael; the "Duke of Moncado," by Vandyke; and by his burin, Da Vinci's "Last Supper," notwithstanding its decay, has been rendered with such consummate skill, as to lessen the regret felt for the evanescent condition of the original work. He accepted an invitation from the grand duke to reside at Florence, with a pension of 400 scudi, and a free residence, under condition of keeping a public school; and received marked attentions from the emperor Napoleon, to whom he dedicated his engraving from the "Transfiguration." Morghen died at Florence on April 8, 1833. He had married a daughter of Volpato's in 1781. His life, with a portrait, and a catalogue of his works, was published by his pupil Niccolo Palmarino. From this work it appears that he has engraved 73 portraits, 47 religious and 44 historical and mythological pieces, 24 views and landscapes, and 18 vignettes, crests, etc.—201 in all. The works of Morghen will always hold a very prominent place in the history of engraving. About the middle of last century, Strange had added a new feature to the art, by introducing, in a remarkable way, what is technically called by engravers "color," or the art of producing by management and variety of line a texture or quality that compensates to some extent for the want of the actual colors in a picture. This influenced the style of Volpato, Cunego, and other Italian engravers of the period, who imitated, though with no very great success, the brilliancy produced by Strange. Morghen, however, went far beyond these Italian engravers, for in his works he united much that was good in the engravings of Strange with a more correct and a purer style of drawing, and thus brought out in a very high degree all the important qualities for which those masterpieces he so skillfully rendered are distinguished.

MORGUE, a French word, denoting the inner wicket of a prison, at which persons accused or condemned are kept for some time, in order that the jailers and turnkeys may examine them at their leisure, so as to be able to recognize them when occasion requires. Hence the application of the word to a certain building (*La Morgue*) in the "city" (*La Cité*) of Paris, situated on the *Quai du Marché neuf*, where the dead bodies of persons unknown, found either in the river (Seine) or in the streets, are exposed to public view for three days. The corpses are put under a glass case, on a sloping slab of black marble. They are wholly naked, except across the middle, which is covered with a piece of leather. The clothes are hung on the wall above. When a corpse is recognized it is handed over to the relatives or friends of the deceased, on payment of costs and dues—otherwise it is interred at the expense of the city. The number of bodies yearly exposed in the *Morgue* is about 300, of which five-sixth are those of males.

MORGUE (*ante*). Morgues have been established in the principal American cities; in New York in 1866, in Boston in 1851, in Brooklyn in 1870, in Chicago in 1872, in St. Louis in 1874.

MORIAH, MOUNT. See JERUSALEM, *ante*.

MORI, the family name of the daimios or feudal princes of the provinces of Suwo and Nagato (or Choshiu) in Japan. During the 15th and 16th centuries, the Mori family ruled 11 provinces, but after being humbled by Taiko they held in fief only the provinces of Suwo and Nagato; and as such, were guardians of the straits of Shimonose'ki (see SHIMONOSEKI). Nagato was long the seat of Dutch learning, and many students were sent to Europe and America, though under the ban of the Yedo authorities. The Mori family and their retainers were very active in the revolution of 1868, and took the field against the Tycoon, armed with American rifles. Among the many able men from this province were Kido, Hirosawa, Inouye, and other high officials and statesmen. Three cadet families formerly held fiefs under the feudal system. The Mori crest is a transverse bar under which are three balls.

MORI, ARINORI, a Japanese statesman, b. in Satsuma about 1848. He was one of the first natives to escape from Japan and the repressive measures of the tycoon. Reaching England, he spent two years in study, and returning to Japan took a seat in the national legislature, proposing the abolition of the ancient custom of wearing two swords. This measure, though at first angrily condemned, was finally adopted. Mori was the first Japanese ever chosen to fill a permanent diplomatic post abroad. This was at Washington, D. C., as *chargé d'affaires*, in 1871. While here he composed a work on *Life and Resources in America*, which was translated and circulated in Japan. He also collected in a pamphlet the views of leading American educators on the subject of education for Japan, and petitioned his government in an able memorial on behalf of liberty in religious matters. Recalled in 1873, he was soon after sent as minister plenipotentiary to Peking, and assisted to secure the Japanese treaty with Corea, Feb. 27, 1876. In 1879 he was appointed minister plenipotentiary to the court of Great Britain, a post which he still holds. In 1874 he married a Japanese lady of Shidzuoka, according to the western principle of equality of goods and legal status—an innovation of great social influence on the position of woman in Japan. Latterly he has written his name MAURY.

MÓRIER, JAMES, 1780–1848; b. England; traveled extensively in the east, and described his journey in his *Travels through Persia, Armenia, and Asia Minor*. He afterwards resided for six years in Persia, as private secretary to the British minister, and became familiar with the character and customs of the inhabitants—a knowledge which he soon made use of in novels of eastern life. The first and most popular of these, *The Adventures of Hajji Babá*, appeared in 1824. It was followed by *Zohrab*, and *Ayesha, the Maid of Kars*.

MÖR'IKE, EDUARD, b. Würtemberg, 1802; educated at the Stuttgart gymnasium, and Tübingen, where he studied for the ministry. He was for a time settled over a church, but was compelled to leave the ministry on account of ill-health, and became a teacher in Stuttgart. He has published a number of novels and poems, and translations of Theocritus and Anacreon. His *Poems* appeared in 1838; *An Idyll of Lake Constance* in 1846; and *Four Tales* in 1856.

MORILLO, PABLO, 1777–1838; b. Spain; count of Cartagena and marquis of Fuentes; entered the Spanish navy in 1793. During the war carried on by the Spaniards against Napoleon he raised a guerrilla corps, at the head of which he soon acquired reputation and became a lieut.gen. In 1815 he was placed in command of 12,000 men and sent to South America to conquer the insurgent provinces of Venezuela and New Granada; but after many alternations of fortune his army was routed and he was recalled. He then joined the court party and was believed to be one of the authors of an insurrection of the guards in July, 1822. After this he went over to the patriots, obtained command of an army corps, changed back again and submitted to the French intervention. His former treason, however, was not pardoned by the restored king, and he died in exile in France.

MORIN, ARTHUR JULES, b. Paris, 1795; educated in the polytechnic school, and in 1839 made professor of industrial mechanics in the *conservatoire des arts et métiers* of Paris. In 1843 he became member of the academy of sciences; in 1850 was appointed to aid in organizing an agricultural institute for France; in 1851 commissioner to the exposition of London; the following year director of the *conservatoire*, which place he retained till 1873; in 1855 was president of the executive committee of the Paris exposition, and in 1862 president of the society of civil engineers. Morin has occupied the unique position of receiving all the military grades up to gen. of division without leaving the duties of his directorship of the conservatory of arts and trades. He was the inventor of a dynamometer-crank by which the force of living motors is measured and the laws of momentum of falling bodies determined. His scientific publications alone form a library, beginning with 1831 and ending with 1871, and have been a fertile source of information to scientists and machinists of all nations.

MO'RION, an iron or steel head-piece worn by a man-at-arms in the days when armor was used. It was distinguished from the helmets of the knights and esquires in having neither visor nor beaver. Under the Norman laws every yeoman between certain ages was bound to keep his morion ready for service.

MORISON, JOHN HOPKINS, b. N. H., 1808; studied at Phillips Exeter academy, and graduated at Harvard college in 1835; was settled over the Unitarian society in New Bedford, Mass., and in 1846 in Milton, where he still preaches. He published *Life of Jeremiah Smith; Disquisition and Notes on the Gospel of Matthew*. He is now one of the editors of the *Unitarian Review*, and has been editor of the *Monthly Religious Magazine*; also a frequent contributor to the *Christian Examiner* and other Unitarian journals. He received the degree of D.D. from Harvard college. He is regarded as an evangelical Unitarian.

MORISON, ROBERT, M.D., one of the most eminent botanists of the 17th c., was a native of Aberdeen, and having borne arms as a royalist in the civil wars, retired to France about 1650, and became superintendent of the garden formed at Blois by Gaston, duke of Orleans. After the restoration he was appointed by Charles II. one of his physicians, and "botanist royal," and became professor of botany at Oxford. He died in 1683. His great work is *Plantarum Historia Universalis Oxoniensis* (2 vols., 1676–99). He also wrote on umbelliferous plants.

MORISONIANISM, a name freely used to designate the distinctive tenets of the evangelical union (q.v.), but never accepted by that religious body. The system of doctrine so designated is fully enunciated in an authoritative document entitled *Doctrinal Declaration*, which was issued by the evangelical union conference of 1858—not as a fixed creed, but as a testimony to their distinctive faith. Being a recoil from the dominant Calvinism of Scotland, it is of the Arminian type, but without any latitudinarian savor. The charge of Pelagianism often urged against it is indignantly repudiated by evangelical unionists, and, with reference to some modern aspects of Calvinism, is by them spiritedly retorted. It is a form of doctrine, in fact, which very nearly corresponds to that type of evangelical Arminianism which obtains among the Wesleyans. Like that, it originated in an element of revival; and now, after the lapse of a generation, these same tenets are largely insisted on by revival preachers of the orthodox bodies at the present day. This coincidence is explained by the felt need, in all efforts to bring men to religious decision, to give prominence to the universalities of gospel grace, the duty of immediate faith, and the importance of peace with God as a subjective condition of the Christian life. It was these, and especially the doctrine that Christ died as an atonement in the same plenary sense for all men, which led to the separation, in 1841, of the rev. James Morison of Kilmarnock (now Dr. Morison of Glasgow) from the United Secession church, and of other three ministers at subsequent synods, and to the formation by them of the evangelical union in May, 1843. A theological academy was at the same time instituted, presided over by Dr. Morison, at which from 20 to 30 students annually receive training for the ministry. Many of these have gone to England, and some have obtained good positions among the nonconformists there. The evangelical union now embraces about fourscore ministers and churches, all independent in polity, but many having ruling elders. In brief, the most distinctive doctrine of evangelical unionists is that which they prominently exhibit as the three great universalities of gospel grace—namely, the divine Father loves all, the divine Saviour died for all, the divine Spirit strives for the salvation of all. Believing in the entire freedom of the human will, they hold predestination to be conditional. On such cardinal doctrines as the trinity, atonement, justification, and the like, they symbolize with other bodies known as evangelical.

MORLAIX, a sea-port of France, in the department of Finistère, 45 m. n.n.e. of Quimper. Vessels of 40 tons can reach the quays of the town. Pop. '76, 13,519.

MORLAKS, the name of a maritime people occupying the coast of Dalmatia on the Adriatic, and a part of Austro-Hungary. They are of the Slavic race; but are a distinct people, mostly sea-faring, and are drawn upon to man the Austrian navy. The territory occupied by them is called Morlacca, and the strait which separates it from the islands of Pago, Arbe, and Veglia, is known as the strait of Morlacca.

MORLEY, HENRY, b. England, 1822; educated in Germany and at King's college, London; after which he taught a successful school near Liverpool. In 1847 he published some papers in respect to the public health, which attracted the attention of Charles

Dickens, and led to an engagement as assistant editor of *Household Words*, a position that he retained six years. Then he became one of the editors of the London *Examiner* and a lecturer at King's college. During these years he also published *The Dream of the Lily Bell*, tales and poems; *Sunrise in Italy*, poems; *A Defense of Ignorance;* lives of Bernard Palissy, Gerome Cardan, and Henry Cornelius Agrippa; and a collection of his contributions to *Household Words*, under the title of *Gossip and Memoirs of Bartholomew Fair*. Since 1865 he has been professor of English literature in University college, London, and has written a large and a small *History of English Literature*, and edited an edition of *The Spectator*.

MORLEY, John, b. England, 1838; graduated at Oxford in 1859, and during several years afterward edited a journal called the *Literary Gazette*, and contributed to *The Saturday Review*. In 1867 he published an historical study of Edmund Burke, which introduced him to the general public, and shortly afterward he succeeded George Henry Lewes as editor of *The Fortnightly Review*, in which capacity he became well known as a political and religious radical. He contested the borough of Blackburn in 1869 for a seat in parliament, but unsuccessfully. Since then he has published *The Limits of the Historic Method; The Struggle for National Education; Critical Miscellanies;* and elaborate critical studies of *Voltaire; Diderot;* and *Rousseau*.

MORLEY, Thomas, d. 1604; b. England; graduated at Oxford, and was appointed, after studying music with William Birde, a "gentleman of queen Elizabeth's chapel," in 1592. He was familiar with the works of the Italian composers, and many of his compositions are madrigals and canzonets in the Italian manner. He also wrote a number of anthems. He edited a collection of madrigals by different English composers, one of whom was the father of John Milton, in honor of Elizabeth, who appears in it as Oriana. The title of this book is *The Triumphs of Oriana*. Morley was also the author of a work called *A Plaine and Easy Introduction to Practical Musicke*.

MORMONS,* or, as they call themselves, The Church of Jesus Christ of Latter-Day Saints, are a religious sect founded by a native of the United States named Joseph Smith. Smith was the son of a farmer, and was born in the town of Sharon, Windsor co., Vt., Dec. 23, 1805. When he had reached the age of 10, his parents removed to Palmyra, in the state of New York, and four years later, to the town of Manchester, about 6 m. off. The reputation of the family is said to have been of the worst kind; we are told that they avoided honest labor, were intemperate, untruthful, and suspected of sheep-stealing and other offenses. These accusations are generally denied by Mormons but Smith himself partly admitted them, affirming that he "had never done anything so bad as was reported of king David, the man according to God's own heart." Nevertheless, a rude sensual religiosity appears to have been mixed up with his more carnal conduct. There is the most satisfactory evidence—that of his enemies—to show that from an early period he was regarded as a visionary and a fanatic. This fact is of the utmost importance as affording a clew to his *real* character, and an explanation of that otherwise unaccountable tenacity of purpose and moral heroism displayed in the midst of fierce persecution. A *mere* impostor—i.e., a person who did not, in some sense or other, partly believe in his own mission, but who, on the contrary, felt that he was simply the liar and cheat that people called him—would have broken down under such a tempest of opposition and hate as Smith's preaching excited.

"When about fourteen years of age," Smith says, "I began to reflect upon the importance of being prepared for a future state." He then describes how he went from one religious denomination to another, but could find nothing satisfactory—nothing but "a great clash in religious sentiment." Then he began to withdraw into secret places, to spend hours in prayer and meditation, and to receive angelic visits. The second of these happened on the evening of Sept. 21, 1823, when it seemed as though the house was filled with "consuming fire." In a moment a "personage" stood before him, "with a countenance like lightning," and "visible to the extremities of the body," who "proclaimed himself to be an angel of God." He informed Smith of various important particulars, as, "that his sins were forgiven, and his prayers heard; that the covenant which God made with ancient Israel was at hand to be fulfilled; that the preparatory work for the second coming of the Messiah was speedily to commence; that the time was at hand for the Gospel to be preached in its power and fullness to all the nations; and that Smith was chosen to be an instrument in the hands of God to bring about some of his purposes in this glorious dispensation." Besides all this, the angel gave him, by way of appendix, "a brief sketch of the origin, progress, civilization, laws, and governments" of the aboriginal inhabitants of America—"of their righteousness and iniquity; and the blessings of God being finally withdrawn from them." He was also informed where some plates were deposited, containing an abridgment of the records of the ancient prophets that had existed on the American continent. The angel appeared to Smith thrice that night, and afterwards paid him many visits. He told him where the records were deposited, "on the west side of a hill, not far from the top, about four miles from Palmyra, in the county of Ontario, and near the mail-road, which leads thence to the little town of Manchester." He advised him to go and view them, which Smith did; but the prophet was not yet holy enough to obtain possession of them.

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* The origin of this name will appear in the sequel.

At length, after due disciplinary probation, the angel of the Lord, on Sept. 22, 1827, placed in Smith's hands the wonderful records. They were engraven on plates nearly 8 in. long by 7 wide, a little thinner than ordinary tin, and bound together by three rings running through the whole. The volume was altogether about 6 in. in thickness, a part of which was sealed. The characters, letters, or hieroglyphics upon the unsealed part were small, and beautifully engraved. They represented an unknown language called the "Reformed Egyptian." Along with the records was found a curious instrument, called by Smith "urim and thummim," consisting of two transparent stones, set in the rim on a bow fastened to a breastplate. By means of these stone spectacles, God enabled him to understand and translate the ancient records into such humble English as the "prophet" (who had received almost no school-education, and could read with difficulty) was master of. The records contain the primitive history of America, from its first settlement by a colony that came from the tower of Babel, at the confusion of languages, to the beginning of the 5th c. of the Christian era. These primitive colonists were called Jaredites; they were a wicked and bloody race, and finally, like the Kilkenny cats, mutually destroyed each other, millions being slaughtered in the final conflicts. Silence again settled down upon America. But a new race came directly from Jerusalem about 600 B.C. These consisted of Lehi and his wife; his four sons, Laman, Lemuel, Sam, and Nephi, together with their four wives; two "sons of Ishmael," and their two wives; Zoram, a servant, and his wife; in all, 16 men and women. They are supposed to have landed on the coast of Chili. After the death of Lehi, quarrels broke out among the brothers. The Lord had appointed Nephi to be the ruler of the new race of colonists but his elder brothers would not hear of it; as a punishment for which, they and all their posterity were condemned to have dark skins, and "to become an idle people, full of mischief and subtlety, which did seek in the wilderness for beasts of prey." They are the ancestors of the American Indians, who are thus, according to Smith's records, simply *bad* Hebrews. The descendants both of Nephi and of his rebellious brothers, increased and multiplied, but were almost continually at war with each other. In the time of Nephi the second an awful earthquake announced the Crucifixion. Three days afterward Christ himself appeared out of heaven; showed the Nephites his wounded side and the print of the nails; instructed them for forty days in the truths of Christianity; healed the sick, blessed children, administered the sacrament, and planted churches, with apostles, prophets, pastors, teachers, and evangelists—the same order, the same priesthood, the same ordinances, gifts, powers, and blessings as were enjoyed on the eastern continent. Hostilities, however, between the Nephites and their dark-skinned brethren continued to rage as fiercely as ever; gradually the purity of their faith declined; and finally, in 384 A.D., a decisive conflict took place at the hill Cumorah, in western New York, where the Christian Nephites were nearly annihilated; miracles now ceased, and unbelief gradually became supreme. Shortly before this, however, a prophet called MORMON had been commissioned by God to write an abridgment of all their prophecies, histories, etc., and to hide it in the earth, till God should see fit to bring it forth, and "unite it with the Bible for the accomplishment of his purposes in the last days." This is the famous BOOK OF MORMON, believed by the followers of Smith (hence called MORMONS and MORMONITES) to be of equal authority with the Jewish and Christian Scriptures, and to form an indispensable supplement to them, containing God's revelations to the new, as the others to the old world. In 420 A.D. they were finally sealed up where Smith found them, by Moroni, one of the few survivors of the battle of Cumorah.

The way in which Smith translated was as follows: he sat behind a blanket hung across the room to keep the sacred records from profane eyes, and read off by the help of his "urim and thummim," to one Oliver Cowdery, who wrote down what the invisible "prophet" gave as a translation—Smith himself being, as he confesses, but a "poor writer." A farmer, of the name of Martin Harris, supplied Smith with the necessary funds to get the work printed. The *Book of Mormon* finally appeared before the world in 1830, with the names of Oliver Cowdery, Martin Harris, and David Whitmer appended to a statement that an angel of God had come down from heaven and shown them the original plates. This was immediately followed up by the testimony of eight other witnesses, among whom were Smith's own father and two brothers (suspected, however, it must not be forgotten, of being addicted to sheep-stealing and other nefarious practices), who affirmed that "Joseph Smith, junior," had shown them the mysterious plates. These, however, are the only persons who have been so privileged. No other human being has ever seen them. Like Macpherson's Ossianic MSS., they have never been forthcoming, however loudly demanded, and of late years all knowledge of them has become traditional.

Attention was soon drawn to the newly published work, and a controversy sprung up regarding its real authorship. Evidence was brought forward by the opponents of Smith to show that, with the exception of certain illiterate and ungrammatical interpolations, bearing on religious matters, the so-called *Book of Mormon* was really borrowed or stolen nearly *verbatim* from a MS. romance written by a quondam clergyman, named Solomon Spalding, who died in 1816. It is unnecessary to go over the arguments *pro* and *con*. Suffice it to say, that *anti*-Mormons generally think them conclusive; while the "saints" consider the whole story of Spalding's MS. romance a scandalous fabrication. About 1829 Smith became acquainted with one Sidney Rigdon, originally a compositor and preacher, but who by this time had begun to promulgate a species of incipient Mormonism, and had managed to found a little sect of his own. It is conjectured by the opponents of Mormonism that Rigdon (into whose hands Spalding's romance is supposed to have fallen for some time) gave it to his new associate to further his purposes, and that the latter—in whose soul there may have been (according to our theory of his character) some rude and gross religious notions and feelings—devised the ungrammatical interpolations. This theory acquires some probability from the fact that these religious passages do not refer to old-world faiths and the practices of an ancient ritual, but to quite modern questions, such, we are told, as were rife in the villages of western New York about 1830. Calvinism, Universalism, Methodism, Millenarianism, Roman Catholicism, are discussed, if not in name, yet in reality. Infant baptism is condemned; so, strange to say, are polygamy and freemasonry.

Undeterred, nevertheless, by exposure, ridicule, and hostility, Smith and his associates persevered in preaching their "doctrine," which was a new Americanized phase of millenarianism. They declared that the millennium was close at hand, that the Indians were soon to be converted, and that the New Jerusalem—the final gathering-place of the saints—was to be somewhere in the heart of the American continent. The "prophet's" house "was frequently beset by mobs and evil-designing persons; several times he was shot at, and very narrowly escaped;" but his fearless courage continued to bring him disciples; and on April 6, 1830, the *Church of Jesus Christ of Latter-day Saints* was first organized in the town of Manchester, N. Y. Smith was fiercely attacked by the leaders and preachers of the other religious denominations, but he kept his ground stubbornly, argued pretty well, and when argument failed, had recourse to a style of zealous prophetic asseveration, which is generally irresistible with weak and ignorant people. If the orthodox preachers, however, could not baffle him in speech, they knew how to inflame their hearers with the most ferocious animosity against the new sect; and in Jan., 1831, Smith and his followers considered it prudent to remove to a distant part of the country. They established themselves at Kirtland, in Ohio, which was to be the seat of the New Jerusalem. They now made immense progress. Their missionaries were full of zeal (none more so, however, than Smith himself), converts were made in great numbers, and churches were established in the states of Ohio, Pennsylvania, New York, Indiana, Illinois, etc. Still the eyes of the new sect turned westward—to the region of the great prairies, where they might be allowed to work out their system in peace and freedom. In the autumn of 1831 a colony was established in Jackson co., Mo., which a "revelation" given to Smith assured the saints was "the land of promise and the place for the city of Zion." Land was largely bought; preaching was vigorously carried on, a printing-press was established, a monthly periodical, *The Morning and Evening Star*, and a weekly newspaper, *The Upper Missouri Advertiser*, were started to propagate the doctrines of the new sect; everywhere was visible a spirit of industry, sobriety, order, and cleanliness. It is only fair to the Mormons to state these things. Account for it how we may, they were, in many important respects, morally, socially, and industrially, far in advance of their neighbors. When Smith returned to Kirtland, he set up a mill, a store, and a bank, and continued his propagandist labors with great success, but not without savage persecution; thus, for example, on the night of Mar. 22, 1832, a mob of Methodists, Baptists, Campbellites, and other miscellaneous zealots, broke into the prophet's house, tore him from his wife's arms, hurried him into an adjoining meadow, and tarred and feathered him! Sidney Rigdon was similarly handled, and rendered temporarily insane. Smith, however, undaunted by this brutal treatment, preached next day with his "flesh all scarified and defaced," and proved the folly of persecution by baptizing three new converts in the afternoon. Meanwhile, the brethren in Missouri continued to prosper, but this very circumstance deepened the animosity towards them of all who were not Mormons. Whispers also began to be spread about their indulging in a community of wives. The rumor was not true, but it probably originated in Rigdon's theory of the "spiritual wife," which Smith at first denounced, but afterwards accepted, and thereafter commenced "sealing wives" to himself in some mysterious way that Gentiles cannot yet fathom. The first step towards polygamy—a doctrine not yet revealed, however (in fact, *contrary* to the "revealed" doctrine on the subject), materially helped to inflame the hostility of the impulsive and unscrupulous backwoodsmen. Secret societies (according to Smith, composed "of the basest of men") were formed to expel the Mormons from Missouri; their periodicals were stopped, their printing-press confiscated, their bishops tarred and feathered, and numberless other outrages were committed. Finally, the hapless "saints" were compelled to flee across the Missouri river, and men, women, and children had to encamp in the open wilderness on a winter-night in 1833. They subsequently settled in Clay co., in the same state, where they remained upwards of three years. In July, 1834, they were visited by the "prophet" himself, accompanied by 100 persons, mostly young men, and nearly all priests, deacons, teachers, and officers of the church. During a brief residence of one week among them, he accomplished much in the way of vigorous organization; next year, 1835, a further step was taken in the development of a hierarchy by the institution of a body of apostles—twelve in number—who were sent out to preach the new doctrines among the Gentiles. One of these twelve was the famous Brigham Young, who had become a convert about the close of 1832, and had soon shown himself to be a man of wonderful sagacity and force of character. He was ordered down east among the Yankees, and made numerous converts even among this acute people. In 1837 Orson Hyde and Heber C. Kimball were dispatched as missionaries to England, where they received large accessions to their numbers, especially from the masses in the great manufacturing and commercial towns, Manchester, Liverpool, Leeds, Birmingham, Glasgow, and, above all, from the mining districts of South Wales, where Mormonism, in some places, almost competed for popularity with Methodism itself. Since then they have extended their strange evangelization to the East Indies, Australia, the islands of the Pacific, Egypt, Palestine, Turkey, and almost every country on the continent of Europe.

About the close of 1837 or the beginning of 1838, the bank at Kirtland stopped payment, and proceedings were taken against the prophet and others for swindling. Luckily, just at this moment, he received a "revelation" to depart into Missouri, which he instantly obeyed, with all the more alacrity that internal disorders had painfully manifested themselves in the new colony. These were at last healed; but the conflict between the saints and the other Missourians became fiercer, more envenomed, more sanguinary than ever, assuming, in fact, almost the proportions of a civil war. The prophet and Rigdon were thrown into prison, and finally, towards the close of 1838, the whole body of saints, about 15,000, quitted Missouri, and took refuge in Illinois. Here they obtained a grant of land in the vicinity of the little town of Commerce, a name which the Mormons, in obedience to a "revelation" given to Smith, changed to Nauvoo, or the city of beauty. The country was a mere wilderness when the Mormons settled in it: it soon began to rejoice and blossom as the rose. Lieut. Gunnison (a most intelligent and impartial writer) is forced by facts to be eloquent in praise of Mormon industry, and gives us a perfectly enchanting picture of the new colony. The legislature of Illinois granted a charter to Nauvoo; a body of Mormon militia was formed, under the name of the Nauvoo legion, of which the prophet was appointed commander; he was also appointed mayor of the city, and was thus supreme in all matters civil and military, as well as religious. But the doctrine of "sealing wives" once more roused the wrath of the neighborhood, and serious disturbances took place, the ultimate result of which was that the prophet and his brother Hyram were thrown into prison at Carthage. After a short time it began to be rumored that the governor of the state was desirous of letting the two Smiths escape, whereupon a band of "roughs," about 200 in number, broke into the jail, June 27, 1844, and shot them. Disastrous as this termination of his career was to Smith himself, there cannot be the shadow of a doubt that it was a most fortunate thing for the system which he founded. "The blood of the martyrs is the seed of the church." A halo of solemn and tender glory now encircles the memory of one who stood greatly in need of this spiritual transfiguration. It may here be stated that it cannot be shown that Smith was a polygamist, in our sense of the word. Years after his death, Brigham Young produced a paper which he said was a copy of a "revelation" made to Joseph at Nauvoo, commanding him to take as many wives as God should give him. But it was not till Aug. 29, 1852, at a public meeting held in the Salt Lake City, that the "revelation" was formally received.

Smith's death created great agitation and confusion among his followers. Sidney Rigdon and others aspired to succeed him, but the council of the twelve apostles unanimously elected Brigham Young, and events have shown the wisdom of their choice. The legislature of Illinois having revoked in 1845 the charter given to the city of Nauvoo, and the hostility of their neighbors not having in the least abated, the saints resolved to emigrate far beyond the boundaries of civilization, and to seek a new home amid the solitudes of the Rocky mountains, where they might pass their lives in unmolested peace. Explorers were sent out to examine the country, and brought back a favorable report of the Great Salt Lake valley. See GREAT SALT LAKE, SALT LAKE CITY, and UTAH. In Feb., 1846, the first emigrants crossed the ice-bound Mississippi, settled for a year in Iowa, and then marched under the strictest discipline across the great wildernesses. Agricultural operations were commenced almost the instant they arrived at the shores of the Salt lake. The cheerfulness, intelligence, and zeal exhibited on all sides, were truly admirable. The world has never seen swifter, more active, more glad-hearted colonists than these singular "saints." It would be unfair to shut our eyes to such facts. In judging Mormonism, we must keep them constantly in view, to prevent us from forming mere abstract and theoretical decisions, which will not in the least affect the future of Mormonism. Brigham Young arrived in the valley July 24, 1847, and the main body of the Mormons in the autumn of 1848. The Salt Lake City was soon founded, an emigration fund established, and settlers poured in from all parts of Europe and America; and perhaps a greater amount of physical comfort was enjoyed here than in any other part of the world. In 1850 the government of the United States admitted the region occupied by the Mormons into the union as a territory, under the name of UTAH, and Brigham Young was appointed governor by president Fillmore. District judges were also appointed by the federal government, but these were looked upon with great suspicion and mistrust by the saints, who finally drove them out of the country in 1851. Brigham Young was now suspended from his office of governor, and col. Steptoe of the U. S. army was appointed his successor. He arrived in Utah in 1854, but found it prudent after some time to withdraw from the country. During the next two years the collisions between the U. S. officers and the saints became more and more frequent, and in the spring of 1856 the whole of the former were forced to flee from the territory. A new governor, Alfred Cumming, was appointed by the authorities at Washington in 1857 and also a new superintendent of Indian affairs; besides a force of 2,500 men was sent to enforce obedience to the laws of the United States. The saints attacked their supply trains, and compelled the enemy to winter at some distance from the Salt lake. In the early part of next year negotiations were entered into between the contending parties; the Mormons submitted to the federal authority, and the federal troops were allowed to encamp on the western side of lake Utah, about 40 m. from Salt Lake City, where they remained till 1860, when they withdrew. After the close of the civil war, the United States seemed determined to insist on its authority. A federal governor was again appointed, and polygamy was declared in 1871 to be a criminal practice contrary to the laws of the United States; Brigham Young was even arrested. One of the most notable events in the recent history of the Mormons took place in the year of Brigham Young's death (1877). John D. Lee, a Mormon bishop, was brought to trial and executed for his share in a crime till then uninvestigated. In 1857 a party of Mormons and Indians, under Lee's command, assaulted a train of 150 non-Mormon emigrants at Mountain Meadows, near Utah, and massacred every soul of them. The complicity of the leaders of the church was not proved, but Lee had been clearly the immediate instigator of the deed.

Hierarchical Organization.—Mormonism is a pure theocracy; its priesthood, who rule in matters temporal and ecclesiastical, are divided into various orders. The highest is the *first presidency*, composed of three persons, who are the successors of Peter, James, and John in the Gospel church. Of these, even Brigham Young was nominally only *primus inter pares*. The first presidency is elected by the body of the church, and possesses supreme authority. The second office in point of dignity is that of *patriarch*, held at present by the nephew of Joseph Smith, whose chief duty is to administer blessings. Then follows the council of "the twelve," whose functions are of great practical importance. They ordain all other officers, elders, priests, teachers, and deacons; they baptize, administer the sacraments, and take the lead in all meetings. Next come the *seventies* (of whom there are many). They are under the direction of the "twelve apostles"—and are the great propagandists, missionaries, and preachers of the body. The fifth order is that of *high-priests*, composed usually of men advanced in years. Their duty is to officiate in all the offices of the church when there are no higher authorities present. After these come the *bishops*, who are "overseers" of the church chiefly in secular matters, attending to the registration of births, marriages, and deaths, the support of "literary concerns" (such as newspapers and magazines), house-visiting, the settlement of private grievances, and the care of the poor. Indeed, according to Dixon (*New America*, vol. i., p. 260), "a bishop's main function is to see that no man in his ward, in his county, is in want of food and raiment." The duties of the *elders* are not very precise, they are charged with the conduct of meetings, and exercise a general surveillance over the *priests*, who correspond to the "fixed ministry" of other sects, i.e., they preach, exhort, and expound the Scriptures. The lowest orders are the *teachers* and *deacons;* the former are simply assistants to the priests, elders, and bishops, and act as catechists; the latter are church-collectors, treasurers, etc.—The whole priesthood is divided into two classes, the Melchisedek and the Aaronic. To the first belong the offices of apostle, seventy, patriarch, high-priest, and elder; to the second, those of bishop, priest, teacher, and deacon. The latter can be held only by "literal descendants of Aaron," who are pointed out by special revelation.

Doctrine.—The saints are almost incredibly materialistic in their doctrines. Their godhead is formed on Buddhistic principles. While professing to believe in the trinity, they explain that God was once a man, who has, however, so advanced in intelligence and power that he may now be called (comparatively speaking) perfect, infinite etc., but that he has still the form and figure of a man; he has even "legs," as is evident (says Mr. Pratt, "the leading scholar of the Mormon church") from his appearance to Abraham, though he has this advantage over his creatures, that "he can move up or down through the air without using them." Christ is the offspring of the "material" union, on the plains of Palestine, of God and the virgin Mary—the latter being duly married after betrothal by the angel Gabriel. Yet he is believed to have had a previous existence, to have even made the universe out of "unformed chaotic matter as old as God," and his worship is enjoined as Lord of all. The Paraclete is vaguely described, but is also material. It would appear, however, that there is an older trinity, that of "Elohim, Jehovah, and Michael, which is Adam." Adam, again, is declared to be the "god" of Jesus Christ; Jesus Christ, the god of Joseph Smith; and Joseph Smith is now the god of this generation: but the whole affair is a mass of unintelligible rubbish. The human intellect probably never sank into more abysmal nonsense; all that can be definitely set before the mind is that Mormons believe that by faith, obedience, holiness, any man may rise into a deity, and acquire the power of making, peopling, and ruling a "world" forever! The *second* article of the Mormon creed affirms that "men will be punished for their own sins, and *not* for Adam's transgressions;" the *third* article states that "through the atonement of Christ, all mankind may be saved by obedience to the laws and ordinances of the Gospel." The *fourth* article affirms these "ordinances" to be: 1. Faith in the Lord Jesus; 2. Repentance; 3. Baptism; 4. Imposition of hands by the gift of the Holy Spirit; 5. The Lord's Supper, administered kneeling. The saints, who are much averse to strong drinks, use water instead of wine in the sacrament, which is taken every week. The *fifth* article declares that "men must be called to the work of God by inspiration;" the *sixth*, that the same organization must now exist that existed in the primitive church; the *seventh*, that miraculous gifts—"discerning of spirits, prophecy, revelations, visions, healing, tongues," etc —have not ceased. The "discerning of spirits" led Smith, or rather his friends Rigdon, Pratt, etc., who are understood to be the real authors of the metaphysics, into a variety of curious speculations. They believe that the soul of man was not created, but "coexisted equal with God." The *eighth* article is decidedly liberal; it expresses a belief that the word of God is recorded not only in the Bible and the book of Mormon, but in "all other good books." As for the contradictions that exist in the first, they are admitted, but it is alleged that they are "corruptions," and that they can be removed by any prophet's inspired explanations. On the other hand, the statement that the saints pretend to have a new and inspired translation of the Bible was denied by Brigham Young in a conversation with Dixon (*New America*, vol. i. pp. 216–217). The *ninth* article expresses a belief in all that God has revealed, is revealing, or will yet reveal. The *tenth* affirms the literal gathering of Israel, the restoration of the ten tribes (the "American Indians," who are, in consequence, treated with considerable humanity by the saints; the negro, on the other hand, being excluded from the Mormon church, as a descendant of Cain), the establishment of the new Zion on the western continent—the millennial reign of Christ on earth, and the transformation of earth into a paradise. The *eleventh* article maintains "the literal resurrection of the body." The *twelfth* article asserts the absolute liberty of private judgment in matters of religion; the *thirteenth* declares it the duty of the saints and all others to be "subject to the powers that be," whether monarchical or republican. The *fourteenth* and last is worthy of being universally accepted: "We believe in being honest, true, chaste, temperate, benevolent, virtuous, and upright; and in doing good to all men;" also that "an idle or lazy person cannot be a Christian, neither have salvation."

The great social peculiarity of the sect is their practice of polygamy. It was not so, however, at first. Rigdon, Kimball, Pratt, Hyde, and Young are its true originators; Emma, wife and widow of the prophet, stoutly denied that her husband ever had any wife but herself. Young's "revelation" she declared to be a fraud, and in consequence she withdrew to Nauvoo. Her four sons followed her, and have now founded a monogamic Mormon community, called the *Josephites*. Another branch of the Mormons (who altogether may number 200,000 souls) has recently settled at Independence, Missouri, the proposed site of the "New Jerusalem." Meanwhile, at Salt Lake City, the practice of polygamy is encouraged on the ground that the rank and dignity of the saints is proportioned to the number of their wives and children. A defense of the practice is also set up on moral grounds. Mormons assert that their community is free of the horrible sin and viciousness that prevail elsewhere; fornication and adultery, with their guilty passions and abandoned conduct, are declared to be unknown; their wives are asserted (Burton and others are very strong on this point) to be happy, virtuous, and healthy and they challenge comparison in regard to their domestic and social purity and felicity with any monogamic community in the world. Dixon (*New America*, vol i. p. 243) even sings a sort of pæan on their virtues: "Their streets are clean, their houses bright, their gardens fruitful. Peace reigns in their cities. Harlots and drunkards are unknown among them. They keep open more common schools than any other sect in the United States."

See *Book of Mormon* (1830); *Book of Doctrine and Covenants*, consisting of select "revelations" given to Smith (1832); *The Pearl of Great Price*, also by Smith (first published, Liverpool, 1851); *Journal of Discourses*, by Brigham Young and others (1854 *et seq.*); *The Exploration and Survey of the Great Salt Lake*, by capt. Stansbury (1849); *The Mormons, or Latter-day Saints*, by lieut. Gunnison of the U. S. topographical engineers (1852); *The Mormons*, by col. T. L. Kane (1850); *The Mormons, or Latter-day Saints, with Memoirs of the Life of Joseph Smith* (office of the national illustrated library, London); *Voyage au Pays des Mormons*, par Jules Remy (1860); *The City of the Saints*, by R. F. Burton (1861); Dixon's *New America* (1867); and Busch, *Geschichte der Mormonen* (Leipsic. 1870).

MORMONS (*ante*). By the death of Brigham Young, which occurred Aug. 29, 1877, the office which he filled fell to John Taylor, an Englishman, though Young's actual position of leader of the Mormons descended to George Q. Cannon, entitled "first counselor" to the president, also an Englishman, a delegate in congress, the Mormon attorney at Washington, and one of the ablest and shrewdest men of the sect. The whole Mormon question has in recent years occasioned considerable uneasiness, both in congress and among the American press and people. The fact that this powerful body is being always increased by the steady influx of foreigners, influenced by a persistent course of proselytism in Europe, has been one reason for this uneasiness, since it results in the erection of an organization of persons alien in birth and sentiment to American institutions, and fostered into a compact body, subordinate to a central leadership, held together by a system combining religious and worldly benefits for the faithful, and in which superstition and entire self-abnegation for the good of "the church" fill important parts. In

1879 the secretary of state of the United States addressed a circular to the U. S. ministers abroad directing them to invite the attention of the governments to which they were severally accredited to the laws of the United States against polygamy. This circular also instructed the ministers to inform these governments as to whatever facts might be in their possession, or which they could obtain from consular agents or otherwise, as to the emigration of Mormons from the different countries; and to request the several governments to enforce existing laws against proselytism and the organization of emigration by the Mormon agents and missionaries. Certain of these governments replied to the diplomatic agents of the United States as to these requests, that it was deemed inexpedient and inconvenient to inquire concerning the religion or place of destination of persons leaving their shores. The circular from the secretary of state also expressed the determination of the government of the United States to enforce the law against polygamy contained in section 5352 of the *Revised Statutes* (the constitutionality of which had been recently sustained by a decision of the supreme court), and to eradicate the institution of Mormonism.

Of the 145,000 people in Utah, about 120,000 are Mormons. But this sect or nation does not alone hold sway in Utah. It has also the balance of power in Idaho and Arizona, and is rapidly populating Washington, Montana, Wyoming, and Colorado. The vote of Idaho, for congressman, at the election of 1880, is alleged to have been carried by an order from George Q. Cannon, directing that all the Mormons in that territory should vote for a certain man whom he named: all the Mormons in Idaho voted accordingly, as a unit. The Mormons are agriculturists, and wherever they go occupy the arable lands for their farms, and the hill-sides for pasturage for their stock. The mines are given up to the Gentiles, who become the patrons of the Mormons for their supplies. Already the Mormons have endeavored to place such a tax on the proceeds of mining in Utah as should render the business unprofitable, and thus remove the only temptation for Gentile settlement. The nature of the people by whom the Mormon territory is being constantly populated by immigration is of a kind to fall readily under the influence of astute leaders: an influence which is assisted by the ignorance and poverty of the immigrants. These immigrants, assisted in leaving a land where they have been forced to live in abject destitution, or by the most arduous labor for the mere necessaries of life, find themselves transported to a country rich in vegetables, meat, fruit, and fish; where, among a people industrious, comfortable, and apparently happy, they are easily imbued with the principles under which these conditions have seemingly been wrought out. The result is subordination to the commands of their leaders; and a confiding belief in the merits of the church and the sect, which is sufficient to render them instruments in the hands of the president and his subordinates. With the death of Brigham Young, the individual leadership of the Mormons ceased. From a statement recently made by the Mormon "bishop" Henry Lunt, of Cedar City, Utah, to a correspondent of the *San Francisco Chronicle*, the following summary of the main features of the organization is condensed: First, there is a president, and he has two counselors. Second, there are twelve apostles. The president is one of them, and each receives a salary of $1500 per annum; the president, moreover, exercising an authority equal to that of the other eleven. Third, there are seven presidents designated as the presidents of the seventies, each body consisting of seventy elders, there being eighty of these seventies in Utah, each seventy having seven presidents, and each seven one president. The seventies make annual reports, and all of these officials mentioned constitute the general authorities of the church. Next comes the head patriarch of the church, the dignity being hereditary when the candidate is worthy, the incumbent residing at Salt Lake City, and being endowed with the power to bless the people by laying on of hands: the present incumbent is John Smith, nephew of prophet Joseph Smith. There is next a presiding bishop who attends to the collection of tithes: the collection from this source being $1,000,000 annually. "Zion" is divided into 23 stakes, each of which has a president, and is divided again into wards, and each ward into districts: the district has a quorum of teachers, whose business it is to visit each family periodically, and look after the spiritual welfare of the members. Each district has a meeting-house, Sunday-school, day-school, young men's mutual improvement society, primary association for small children, and usually a dramatic society. At Cedar City there is a co-operative store, a tannery, and a grist-mill. The church organization ends with the priests and deacons. Out of a total population of about 150,000, there are 30,000 children in Utah under eight years of age. There is a Sunday-school organization known as the Deseret Sunday-school union: there is also a perpetual immigration fund.

As to the possible future of the institution of Mormonism it is proper to quote the following statement of Lunt, setting forth the hopes and designs of the Mormons themselves: "Like a grain of mustard was the truth planted in Zion, and it is destined to spread through all the world. Our church has been organized only fifty years, and yet behold its wealth and power. We look forward with perfect confidence to the day when we will hold the reins of the U. S. government. That is our present temporal aim; after that we expect to control the continent." When the newspaper correspondent, to whom this was said, remarked that such a scheme seemed somewhat visionary, considering the fact that Utah cannot secure recognition as a state, the bishop's reply was: "Do not be deceived; we are looking after that. We do not care for these territorial officials sent out to govern us. They are nobodies here. We do not recognize them. Neither do we fear any practical interference by congress. We intend to have Utah recognized as a state. To-day we hold the balance of power in Idaho, we rule Utah absolutely, and in a very short time we will hold the balance of power in Arizona and Wyoming. A few months ago president Snow, of St. George, set out with a band of priests for an extensive tour through Colorado, New Mexico, Wyoming, Montana, Idaho, and Arizona to proselyte. We also expect to send missionaries to some parts of Nevada, and we design to plant colonies in Washington territory. In the past six months we have sent more than 3,000 of our people down through the Sevier valley to settle in Arizona, and the movement still progresses. All this will help build up for us a political power which will, in time, compel the homage of the demagogues of the country. Our vote is solid, and will always remain so. It will be thrown where the most good will be accomplished for the church. Then, in some great political crisis, the two present political parties will bid for our support. Utah will then be admitted as a polygamous state, and the other territories we have peacefully subjugated will be admitted also. We will then hold the balance of power, and will dictate to the country. In time our principles, which are of sacred origin, will spread throughout the United States. We possess the ability to turn the political scale in any particular community we desire. Our people are obedient. When they are called by the church they promptly obey. They sell their houses, lands, and stock, and remove to any part of the country the church may direct them to. You can imagine the results which wisdom may bring about, with the assistance of a church organization such as ours. It is the completest one the world has ever seen. We have another advantage. We are now and shall always be in favor of woman suffrage. The women of Utah vote, and they never desert the colors of the church in a political contest. They vote for the tried friends of the church; and what they do here they will do everywhere; our principles and our institutions spread."

Three years prior to the death of Brigham Young his nineteenth and last wife, Ann Eliza Webb, broke away from Mormonism, and traveled through the United States delivering lectures against the institution, and particularly its polygamous feature. These lectures produced no small impression. Congress has frequently, in recent years, taken cognizance of the condition of Utah and the institution of Mormonism. In 1873 Mr. Frelinghuysen introduced a bill which severely censured the practice of polygamy among the Mormons, and declared that their wives could claim relief by action for divorce. In 1874 the committee of the house of representatives having the matter in charge reported a bill which was still more sweeping in its character, being destructive of all local authority in Utah, and, in fact, placing the territory in the condition of a province, in its relation to the U. S. government. By this bill the control of affairs in Utah was placed in the hands of federal officials, and its practical application would have been to root out the foundation of the system on which Mormonism depended for its existence. During the same year the case of a contest of the election of George Q. Cannon, as delegate from Utah, came up in the house of representatives, and was decided in his favor. But this decision was accompanied by the passage, by a vote of 127 to 51, of a resolution appointing a committee of investigation into the polygamous relation sustained by delegate Cannon, who, it was alleged, was united by the marriage tie of the Mormon church to four wives. Still later in 1874, what was known as the "Utah judiciary bill," passed the house by a vote of 159 to 25, in the face of a resolute and eloquent defense of Mormon institutions by delegate Cannon. This bill was supposed to comprise "a definite and serious attack at the very foundation of Mormonism." Notwithstanding the action taken by congress on these and other similar bills, no important change has been made in the conduct of affairs in Utah, or in the nature and influence of Mormonism, either as to the increase of the number of its adherents by foreign proselyting and immigration, or by any decline in the spread of its tenets and its power in the territories of the United States.

MORMYRIDÆ, a family of malacopterous fishes, allied to the *esocidæ*, or pike family; having longish compressed bodies, and a slender tail, swelling out at the origin of the caudal fin. The skin of the head is naked, enveloping the gill-covers and gill-rays, leaving only a slit for gill-opening. The mouth is small. All the known species inhabit the rivers of Africa. The SHARPED-NOSED MORMYRUS (*Mormyrus oxyrhynchus*) is regarded as one of the best fishes of the Nile. It is caught by lines baited with worms. The mormyridæ are nocturnal fishes. They are sometimes represented on Egyptian monuments, and seem to have been held sacred by the ancient Egyptians. The modern Egyptian name is *Mizdeh*. Some of the species have electric organs.

MORNAY, PHILIPPE DE, Seigneur du Plessis-Marly, 1549-1623; illustrious as a writer and actor during the most direful period of religious intolerance in France. He was son of a Roman Catholic father who destined him for the church, and of a Protestant mother whose opinions he imbibed; becoming according to Voltaire "the most virtuous, and greatest of men." Thoroughly educated in school, and by much travel in youth in Italy and Germany, we find him at the age of 22 at Cologne engaged in theological discussions and writings to inspire the low countries to defy the Spanish power. His address to Coligny, then minister of France, designed to secure that minister's influence for William of Orange, was a marvel of literary power. The minister had already resolved to send Mornay as confidential representative to that prince when the massacre of St. Bartholemew's took place and the young writer barely escaped from Paris with his life. He fled to England, and immediately sought the influence of Elizabeth to avert the further destruction of Protestants in France. He took part with La Noné in an unsuccessful movement of the Huguenots at St. Germain; married an accomplished Protestant lady in 1576, and immediately after joined the army of Condé in France, from which he was called to become a member of the council of Henry of Navarre. By him he was sent to England on a mission; was intercepted by the Spaniards who, ignorant of his mission, permitted him to escape; and finally succeeded in procuring from Elizabeth 80,000 écus for Condé's army. He remained some years in England occupied in strengthening the Protestant cause at the English court, by his writings, and by material aid. In 1584–88 he was member of the two royal political councils of Montauban and La Rochelle, and remained chief counselor of Henry III. until his assassination. He then served Henry IV., and was by him made councilor of state and engaged in delicate negotiations. When the king abjured Protestantism Mornay broke with him, and published an essay on the institution of the eucharist, in which he shows the mass to be condemned by the New Testament and the fathers of the church. It brought upon his head a storm of invective from all sides, but the answers published only served to cause the more universal reading of the heretical tract. Challenged by Du Perron bishop of Evreux, to maintain the truth of some of its statements in open discussion, he accepted, and was caught in a trap carefully prepared to show some of his statements false. This was May 4, 1600. Henry IV. was glad to be sustained in his treachery to old Protestant friends by the apparent defeat of their ablest champion, and Mornay was retired from public life until 1617, when he appeared in an assembly of notables at Rouen, and again in 1620 in efforts to bring conciliation between insurgent Huguenots and the government of Louis XIII., and soon after retired to his chateau to die. By the Catholics he was called the pope of the Huguenots. In controversial writings he was prolific, scholarly, and brilliant.

MORNING GLORY. See CONVOLVULUS, *ante*.

MORNY, CHARLES AUGUSTE LOUIS JOSEPH, Comte de, a French statesman, of the second empire, regarding whose parentage the biographical dictionaries published under imperial censorship are strangely silent. It is, however, universally believed that he was the son of queen Hortense and of the comte de Flahault, and consequently half-brother of Louis Napoleon. He was born in Paris, Oct. 20, 1811. The comte de Morny, a French nobleman resident in Mauritius, received 800,000 francs to adopt him as his son; but he was educated by his "grandmother," Madame de Flahault; and queen Hortense left him at her death, in 1837, an annuity of 40,000 francs. Morny entered the army in 1832 as a sub-lieut. and is said to have shown at this early period a predilection for metaphysics and theology, which is indeed sufficiently surprising, if true, considering his subsequent thirst for material gratifications. He served with some distinction in Algeria; but he soon abandoned a military life, and in 1838 made his début in the world of industry as a manufacturer of beet-root sugar, and published a pamphlet on the subject. Ever after that time, he was mixed up in all sorts of commercial and financial speculations—railway companies, canal companies, French and foreign mining companies, credit societies, industrial enterprises, etc. Chosen a deputy in 1842, he quickly attained a prominent position on account of his aptitude for dealing with financial questions; but events showed that he was not free from the reckless spirit of an adventurer, and his daring at times excited a suspicion of enormous swindling somewhere. After the revolution of 1848, he became attached to the cause of his half-brother, and was the leader of the subtle and treasonable policy of the Elysée. He took a prominent part in the *coup d'état*. His rôle was to exhibit *sang-froid*, and to throw the republican leaders off their guard. Nor did he fail of success. He passed the evening of Dec. 1 at the *Opéra Comique*, and yet, by six o'clock next morning the deed was done, and Morny was minister of the Interior. In 1854 he became president of the *Corps Législatif*, and was ambassador to Russia during 1856–57, where he married the rich and handsome princess Trubetskoi. The result of his Russian mission was the establishment of intimate political relations between the two governments, and a commercial treaty advantageous to both countries. He died May, 1865.

MOROCCO, or MAROCCO, called by the natives *Maghrib-el-Aksa*, "the extreme west," or briefly *Maghrib*, an empire or sultanate in the n.w. of Africa, is bounded on the e. by Algeria, on the n. and w. by the Mediterranean sea and Atlantic ocean, and on the s. by a line which runs from cape Nun (lat. 28° 45' 43" n.), in an easterly direction through the Sahara to the Algerian frontier in long. 2° east. At the present day, Morocco includes the three former kingdoms of Maghrib, Fez, and Tafilelet, and contains about 260,000 English sq.m., with a population of which the estimates vary from 2,500,000 to 8,000,000. The country is generally mountainous, the Atlas (q.v.) range traversing it in several parallel chains from s.w. to n.e., and sending out numerous spurs to both the coast-country and the desert. There are, however, many level tracts throughout Morocco, especially at its western and eastern extremities, and on the borders of the desert. The central range of the Atlas forms the water-shed separating the streams which flow into the Atlantic and Mediterranean from those which run southward to the desert. The former rivers have the shorter course and less volume, but they are perennial; while the latter become dry in summer, and even when running are lost in the sands of the Sahara. The chief rivers are the Muluya, with its tributary the Sharef, which drains the n.e. of the country, and falls into the Mediterranean after a course of 400 m; the Kos, Oom-a-beg, Bu-Regreb, Tensift, Suse, and Assaker, the last forming for part of its course the southern boundary of Morocco, drain the central and western districts, and fall into the Atlantic; the Draha, Fileli, Ziz, and Gir, irrigate the dry plains of Tafilelet, and the first-mentioned then empties itself into the Atlantic ocean. The subsequent courses of the other three rivers are not yet well ascertained.

The *climate* between the central range of Atlas and the sea is temperate, the thermometer seldom falling lower than 40 F., or rising above 90° F., owing partly to the regulating influence of the sea breeze, and the shelter afforded by the mountains from the scorching winds of the desert; but in the s.e. districts, extremes of heat and cold are said to prevail, and rain is there unknown.

Among the chief *products* of the country are wheat, barley, rice, maize, durra, and sugar-cane; and among fruits, the fig, pomegranate, lemon, orange, and date are common; while cotton, tobacco, hemp, etc., are largely produced both for home use and export. Morocco is supposed to be rich in mineral treasures; plentiful supplies of copper are obtained at Teseleght, near the source of the Assaker, and gold and silver occur in several places. Iron, antimony, lead, tin, and rock-salt, the last three in considerable quantity, are also found. Owing to the character of the country and its thin population (35 to the English sq.m.), Morocco is much infested with wild animals. Lions, panthers, hyenas, wild boars, and various kinds of deer, gazelles, etc., abound in suitable localities, and occasional devastations are committed by locusts. Ostriches are found in Tafilelet. The Moorish horses, formerly so famous, are now much degenerated. The breeding of sheep, oxen, goats, camels, mules, and asses forms an important item of national industry. Oxen and bulls are chiefly employed in field labor.

The *inhabitants*, like those of Barbary in general, consist of Moors, Berbers, Arabs, Negroes, and Jews, with various intermixtures between these races. More than two-thirds of the population belong to the race commonly called Moors, the remaining third consisting mainly of Berbers or Amaziyehs (including the Berbers of the Riff coast, and the Shelluhs of the Great Atlas); Jews, estimated at 340,000; and negroes. Very few Europeans reside in Morocco. The state of civilization is very low, and many of the Amaziyehs are complete savages. Excepting the Jews and the few Europeans, the whole population is Mohammedan. Negroes are brought into the country as slaves from Sudan.

Morocco is divided into four territories—Fez, Morocco, Suse, and Tafilelet. For convenience of administration, the empire is subdivided into 33 governments or districts ("ammala"), each under the superintendence of a "caid," whose chief duty it is to collect the imposts; but the semi-independent tribes are ruled by their own chiefs, and scarcely acknowledge the authority of the sultan. The government is purely despotic, and in the absence of written laws, the will of the sultan and his subordinates decides everything. The public officials eke out their allowances by practicing extortion on those under their charge, and are in turn plundered by their superiors. The sovereign of Morocco, called by Europeans the emperor of Morocco, is known among his subjects as sultan, and assumes the titles of *emir-ul-mumenin*, or "prince of the believers," and *khalifeh-allah-fichalkihi*, or "vicegerent of God upon earth." The title is hereditary in the male line, but does not necessarily descend to the eldest son.

Education consists in learning to read, write, and recite portions of the Koran, and this quantum of education is pretty generally diffused among the people, but the art of printing is unknown, and the arts and sciences are at a very low ebb.

The only industrial arts prosecuted to any considerable extent are the manufactures of caps, fine silks, and leather. In the production of this last, the Moors far surpass Europeans, and are able to render any kind of leather extremely soft and white, by the use, it is said, of two species of plants found in the country, and unknown to Europeans. They also excel in the production of brilliant colors in leather. The yellow leather is made in Morocco proper, the green in Tafilelet, and the red in Fez. There is an important caravan trade between Morocco and Sudan, and also with Mecca and the Levant. The principal exports are wool, hides, grain, cattle and sheep, leather, salt, etc.; and the imports, cotton, linen, and muslin goods, sugar, tea, coffee, hardware, gold dust, indigo, ivory, etc. Mules, horses, and camels form the internal means of transport. Much of the Arabian trade is carried on by coasting vessels between Tangier and Egypt, as the carriage across the desert is very costly. At the present time, two-thirds of the entire trade of Morocco is in the hands of British merchants.

The army consists of between 20,000 and 30,000 men, of whom one-half are negroes; there is also a sort of militia, amounting to 80,000 or 100,000 men, which is occasionally called out. The navy is now insignificant; but in former times, especially in the 16th and 17th centuries, it was very formidable to the maritime powers of Europe, and was chiefly occupied in piratical expeditions. See RIFF.

The history of Morocco is, generally speaking, similar to that of the rest of Barbary (q.v.) down to the end of the 15th century. About that time, it was formed into a monarchy, and, notwithstanding internal divisions, enjoyed considerable prosperity, and the confines of the empire were extended as far south as Timbuctoo. This empire fell to pieces, and was succeeded in 1647 by that of the sherifs of Tafilelet, who conquered both Morocco proper and Fez, and united the whole country under one government. This is the present ruling dynasty. In the middle of the 17th c. the empire of Morocco embraced part of the present province of Algeria, and extended south as far as Guinea, where it came into collision with the Portuguese settlements. Since the commencement of the 19th c. the rebellions of the wild mountain tribes, the disturbances in Algeria, and difficulties with foreign states, caused by the aggressions of the Riff pirates, have greatly retarded the well-conceived measures of the various rulers for the development of the resources and increase in civilization of Morocco. In 1814 the slavery of Christians was abolished; and in 1817 piracy was prohibited throughout Morocco. In 1844 Morocco took part in the war of Abd-el-Kader against the French, in the course of which Tangier was bombarded and Mogadore occupied; but peace was concluded in the same year. In 1851 and 1856 complications took place with France concerning some French vessels which had been plundered by the Riff pirates, but in each case compensation was given by the sultan. In 1859 the Spanish government, smarting under a series of similar outrages, demanded compensation, and also an apology for an insult to the Spanish flag at Ceuta; and on the sultan's disclaiming all responsibility for these acts, war was declared by Spain, Oct. 22, 1859, and a large force under marshal O'Donnell invaded Morocco. Two battles were fought, several ports were bombarded, and Tetuan taken, and on Mar. 25, 1860, the sultan yielded. A treaty was accordingly signed, April 27, 1860, by which the sultan ceded some portions of his territory, paid 20,000,000 piastres towards the expense of the war, and granted several commercial privileges to Spanish merchants.

MOROCCO (Arab. *Marakash*), the capital of the empire of the same name, is situated in the s.w. of the country, four miles s. of the river Tensift, and at the n. end of an extensive and fertile plain. It is surrounded by a strong lime-and-earth wall thirty feet high. The town is ill built, the streets narrow, irregular, and unpaved; the houses, generally built of the same materials as the wall, are one story high, with flat roofs, and narrow openings instead of windows. A large portion of the space within the walls is occupied with gardens, open areas, and market-places. In the bazaar and market-place a large miscellaneous trade is carried on. Morocco possesses twenty mosques, of which six are remarkable for their size and elegance. There are several tanning and leather-dyeing establishments, some of them of great extent. The population is estimated at about 60,000.

On the s. of the city, outside the walls, stands a palace of the sultan of Morocco, occupying a space of about 180 acres.

Morocco was founded in 1072, and reached the summit of its prosperity in the 13th c., when it contained more than 700,000 inhabitants, since which time it has been rapidly decaying. It is now half in ruins.

MOROCCO LEATHER. See LEATHER, *ante*.

MORON', a town of Spain, in the province of Seville, and thirty-seven m. s.e. of the city of that name, on the Guadeira. It is built on irregular acclivities, and contains the remains of a once almost impregnable castle, erected by the Moors on Roman foundations. The inhabitants are engaged in the culture and preparation of olive oil. Pop. 9,000.

MORPETH, a market-town and parliamentary and municipal borough of England, in Northumberland, is situated on the Wansbeck, fifteen miles north of Newcastle. Of the principal buildings, the parish church dates from the 14th c.; the free grammar school of Edward VI., founded in 1552, has an income from endowment of £650 a year; the town-hall was erected by Sir John Vanbrugh. Flannel is manufactured; brewing, malting, and tanning are carried on, and iron-foundries and corn-mills are in operation. Morpeth returns two members to the house of commons. The pop. of the parliamentary borough in 1871 was 30,239.

MORPHEUS (literally, the "shaper" or "fashioner"), in the classic mythology, the son of Somnus, (Sleep), because he shapes or moulds the dreams that visit the sleeper. He is first mentioned by Ovid, and is represented as an old man with wings, pouring somniferous vapor out of a horn,

MORPHIA ($C_{34}H_{19}NO_6 + 2$ Aq) derives its name from Morpheus, in allusion to its narcotic properties. It is the most important of the alkaloids existing in opium, of which it constitutes from one-eighth to one-sixteenth by weight. It occurs in combination with meconic, and sometimes with sulphuric acid. It is obtained in short rectangular prisms, containing two equivalents of water of crystallization, which are expelled at a gentle heat, when the morphia melts into a resinoid substance. Morphia is soluble in about 1,000 parts of cold and in 400 of boiling water; boiling alcohol dissolves it freely, but it is insoluble in ether and chloroform. Its solutions have a bitter taste, and change the yellow color of turmeric paper to brown. Morphia is not so easily detected in cases of poisoning by opium as meconic acid (q.v.). The following are the ordinary tests for it: Concentrated nitric acid, when applied to a crystal either of morphia or of one of its salts, produces an orange color. A mixture of nitric and sulphuric acids colors it green.

When it is mixed with iodic acid, iodine is liberated; which may be recognized by its brown color and by the well-known starch-test. A neutral solution of perchloride of iron produces a beautiful blue color.

Morphia is the only opium-alkaloid which is soluble in lime-water, and this property affords one of the best means of extracting it. A watery infusion of opium is boiled with milk of lime, filtered, mixed with powdered sal-ammoniac, and again boiled. By this means the lime is converted into the hydrochlorate (or, more correctly, into chloride of calcium), the ammonia is volatilized by the heat, while the morphia is precipitated in a crude form, which admits of easy purification.

Morphia combines with acids to form crystallizable salts, which are readily soluble in water and in alcohol. Of these, the *hydrochlorate* (*muriate*) and the *acetate*, especially the former, are much used in medicine.

The therapeutic uses of morphia and its salts are very similar to those of opium (q.v.); but the preparations of morphia are preferable to opium and laudanum in being less liable to occasion nausea and headache. The ordinary dose of morphia, or its hydrochlorate or acetate, when given to an adult to allay pain or induce sleep, ranges from a quarter of a grain to half a grain.

MORPHOLOGY. See Metamorphosis of Organs.

MORPHOLOGY, Animal. See Metamorphosis of Animals.

MORPHY, Paul Charles, b. New Orleans, 1823; educated at St. Joseph's college. While still a boy he developed remarkable skill in the game of chess, and soon became enthusiastic concerning it, and devoted most of his time to this amusement, which was to him a serious study. He speedily became so proficient as to defeat with ease the players of his native city, and his remarkable skill began to attract general attention among chess-players throughout the country. In 1857 the first chess congress was organized in New York, and Morphy, being specially invited to attend, played daily at the rooms of the congress, which were crowded by persons interested in chess, who were astonished at his remarkable facility in this difficult game. He defeated with ease such players as Paulsen, Fiske, Marasche, Lichtenhein, Thompson, Meade, and others, the leading chess amateurs of the country; and in 1858 made his first public exhibition of those astounding *tours de force*, blindfold games, as to which he had but one equal competitor, Paulsen, who was, however, a far inferior player before the board. In the same year he visited London, where he played with Löwenthal, winning a majority of games. He attended, at Birmingham, the annual meeting of the British chess association, where he played eight games at once without the board, defeating his opponents in six of them. In Paris he played at the celebrated chess resort, the *café de la régence*, and defeated the great French players, Rivière, Laroche, Jowmand, and Devinck; beat Harwitz five games out of seven, losing one and drawing one; and out of eleven games played with Anderson, the German champion, beat seven and drew two. He remained abroad until the spring of 1859, exhibiting his remarkable powers with and without the board, and on his return to the United States, was admitted to the bar of New Orleans, where he has continued to reside, practicing, however, but little. He greatly injured his health by the strain upon his mental faculties, occasioned chiefly by his blindfold playing, and was forced at last to give up chess altogether, and never quite recovered his mental condition.

MORRELL, William, b. England; came to Massachusetts bay with captain Robert Gorges, in 1623. He spent a year in the Plymouth colony, and on his return to England published a Latin and English poem, called *Nova Anglia*, suggested by his observations in America. It has been republished by the Massachusetts historical society. Little is known of his life, except that he was a clergyman.

MORRILL, David Lawrence, ll.d., 1772–1849, b. N. H.: at first a physician, then a Congregational pastor at Goffstown. In 1807 he resumed the practice of medicine, from which he retired in 1830. He served for a number of terms in the New Hampshire legislature, of which he was chosen speaker in 1816 and in 1823 he was president of the state senate. In 1817 he was elected U. S. senator, and on the expiration of his term, was elected governor.

MORRILL, Justin S., b. Vt., 1810; a merchant, and afterwards a farmer. He was a member of congress from Vermont, from 1855 to 1867. During much of this period he was chairman of the ways and means committee, and had an important part in the economical and financial legislation that came before congress. He is the author of the famous Morrill tariff of 1861, and a strong advocate of protection. He was elected U. S. senator in 1867, and has been twice re-elected.

MORRILL, Lot M, b. Me., 1813; graduated at Waterville college (now Colby university); was admitted to the bar in 1839. In 1854 he was elected a member of the Maine legislature; two years later, president of the state senate, and in 1858–60, governor. From 1861–76 he was a U. S. senator, an office he resigned to accept the appointment of secretary of the treasury, June 21, 1876. After serving until the completion of president Grant's administration, he received the appointment of collector of customs at Portland, Me.

MORRIS, a co. in e. central Kansas; 700 sq.m.; pop. '80, 9,266—8,243 of American birth. The surface is level and generally fertile. Most of it is prairie, and in the w. portion there is little or no timber. It is watered by the Osage river, and numerous small tributaries of the Kansas river. Limestone is found in some parts. The principal productions are Indian corn, wheat, oats, potatoes, hay, and cattle. It is on the Missouri, Kansas, and Texas railroad. Co. seat, Council Grove.

MORRIS, a co. in n. New Jersey, bounded on the n.e. by the Pequannock river, on the e. and s.e. by the Passaic river, and on the n.w. by the Musconetcong; 650 sq.m.; pop. '70, 43,137—34,530 of American birth. The surface is uneven and crossed by a number of ridges, of which one of the highest, Schooley's mountain, is a summer resort. A large portion is heavily wooded with hickory, oak, and chestnut. There are a number of iron mines, and zinc, copper, and manganese are found. Marble, limestone, and sandstone abound. The principal agricultural products are Indian corn, wheat, oats, rye, buckwheat, and potatoes. Large numbers of the inhabitants are employed in the iron mines, and in the manufacture of nails, and rolled and forged iron. Among the other articles manufactured are woolen and cotton goods, carriages and wagons, sashes and blinds, paper, and brick. There are a number of flour-mills, saw-mills, machine-shops, and distilleries. It is on the Morris and Essex railroad, and the Morris canal. Co. seat, Morristown.

MORRIS, a co. in n.e. Texas, s. of the Sulphur Fork of the Red river. The surface is diversified, and heavily timbered with oak, hickory, ash, and cypress. The soil is fertile, but not much cultivated. The county has lately been set off, and has not yet become thickly settled. Co. seat, Daingerfield.

MORRIS, a city and the co. seat of Grundy co., Ill., on the n. bank of the Illinois river, and the Illinois and Michigan canal, and on the Chicago, Rock Island, and Pacific railroad; pop. '70, 3,138. It has a high-school, 2 newspapers, 2 national banks, and 7 churches. St. Angela's academy, for the higher instruction of women, is here, a Roman Catholic institution, established in 1857. The city is the center of a considerable trade in grain. There are mines of bituminous coal, and flouring mills. Agricultural implements and furniture are also made.

MORRIS, Charles, 1784–1856; b. Conn.; entered the navy in 1799. He was attached to the American squadron in the war with Tripolis, and was made lieut. in 1807. In the war of 1812 he was first lieut. of the *Constitution*, and was dangerously wounded in the engagement between that frigate and the *Guerriere*, Aug. 19, 1812. Two years later, in command of the *Adams*, he cruised along the coast in search of British merchantmen. He was attacked on the Penobscot river by a superior British force, and was obliged to destroy his ship. He continued in the service for the rest of his life, holding various commands. He was successively chief of the bureau of construction, inspector of ordnance, and from 1851 till his death chief of the ordnance bureau.

MORRIS, Edward Joy, b. Philadelphia, 1815; educated at Harvard; elected to the Pennsylvania legislature in 1841. He was a member of congress, 1843–45; and again, 1857–61. He was *chargé d'affaires* at Naples 1850–54, and minister to Turkey 1861–70. He has published a *Tour through Turkey, Greece, Egypt, and Arabia Petræa; The Turkish Empire*; and some translations.

MORRIS, George P., 1802–64; b. Penn.; at an early age he became a journalist in New York city, where in 1823 he established *The Mirror*, a literary weekly that he continued to publish until 1842, when he united with N. P. Willis in publishing *The New Mirror* a year or more, and then *The Evening Mirror*. These publications were the representatives of the best literary, dramatic, and artistic interests of the day, having among their contributors Bryant, Halleck, Poe, Paulding, Leggett, Hoffman, and most of the well-known literary men of New York. In 1845 Mr. Morris originated another journal, *The National Press*, which eventually became *The Home Journal*. It is as a song-writer, however, that he is chiefly remembered; and among the songs which made his name familiar may be mentioned particularly: *Woodman, Spare that Tree, My Mother's Bible, We were Boys Together*, and *A Long Time Ago*. In 1853 he published *The Deserted Bride, and other Poems;* and also during the same year he edited, with Mr. Willis, *Prose and Poetry of Europe and America*. Another of his successes was a drama, *Brier Cliff*, which was played forty consecutive nights in one of the New York theaters.

MORRIS, George Sylvester, b. Vt., 1840; graduated at Dartmouth college, where he was afterwards tutor. After spending a number of years abroad, in the study of philosophy, he was appointed, in 1870, professor of modern languages, and literature in the university of Michigan. He published a translation of Ueberweg's *History of Philosophy*, in 1871. His *British Thought and Thinkers* appeared in 1880. He is now connected with the Johns-Hopkins university at Baltimore.

MORRIS, George U., 1830–75; b. Mass.; entered the navy in 1846, and was lieut., in command of the Cumberland when she was sunk by the Merrimack, Mar. 8, 1862, on which occasion his cool courage gained great praise. He was made a commander in 1866, and placed on the retired list in 1874.

MORRIS, Gouverneur, 1752–1816; b. N. Y.; educated at Columbia, then known as King's, college; studied law, and was admitted to practice in 1771. He was known as a writer of ability while still in his teens; and certain papers by him on finance were highly considered. In 1775 he was sent as a delegate to the provincial congress, and was one of the committee that drafted the constitution for the state of New York. In 1777 he was a member of the continental congress, and of the committee appointed by that body to investigate and report on the condition of Washington's army, then at Valley Forge. He was appointed by Robert Morris, in 1781, assistant superintendent of finance, and held the position for about three years, when he entered into mercantile business. He was sent by Pennsylvania as a delegate to the constitutional convention of 1787, and was appointed one of the committee of five appointed to draft the constitution. In 1791 he was sent by Washington to England on a diplomatic mission; and in the following year was named minister to France, where he remained until 1794, when the French government requested and obtained his recall. In 1800 he was elected to the U. S. senate by the legislature of the state of New York, to fill out an unexpired term. He retired from public life after he had completed the period for which he was elected. He is said to have been an eloquent speaker, and remarkably well informed.

MORRIS, Henry W., 1806–63, b. N. Y.; entered the navy in 1819, and was made capt. in 1856. He was attached to the African, Brazilian, and Mediterranean squadrons successively, and at the beginning of the rebellion was in Washington superintending the construction of the *Pensacola*. He succeeded in running her by the confederate batteries on the Potomac early in 1862, and reached the federal blockading squadron in the gulf of Mexico. He distinguished himself in the attacks upon forts Jackson and St. Philip at New Orleans, after the capture of which he took the command of the squadron stationed there.

MORRIS, John G., D.D., LL.D., b. Penn., 1803; educated at Dickinson college and Princeton theological seminary. From 1826 to 1859 he was pastor of Lutheran churches in Baltimore. He catalogued the books in the Peabody institute at Baltimore, of which he was the first librarian, and prepared a list of lepidoptera found in the United States for the Smithsonian institution. He has edited the *Lutheran Observer* and other periodicals, and has written a number of books: *Popular Exposition of the Gospels; The Life of Catharine de Bora;* and some translations from the German.

MORRIS, John Thomas, b. India, 1826; studied at Trinity college, Cambridge, where he became a Roman Catholic. He completed his education in the English college at Rome, and was ordained to the priesthood. After passing three years in the diocese of Northampton he returned to Rome, and became vice-rector of the English college. At the end of three years he went back to England, where he was appointed canon residentiary of the London chapter. He also acted as private secretary to cardinal Wiseman, and his successor, cardinal Manning. In 1867 he became a member of the society of Jesus. He was for a time rector of a Jesuit college in Malta, and is now professor of canon law and church history in St. Beuno's college. He has published a *Life of St. Thomas of Canterbury; Condition of Catholics under James I.; The Troubles of our Catholic Forefathers*, 3 series; *The Letter-books of Sir Amias Poulet;* and *Cardinal Wiseman's Last Illness.*

MORRIS, L. N., 1800–46; b. New York; grandson of Lewis (signer of the declaration of independence); educated at West Point military academy, graduating in 1820. He was occupied in garrison and frontier duty until the war with Mexico, when he went into active service, and distinguished himself at the battles of Resaca de la Palma and Palo Alto. He was killed at Monterey, being, at the time of his death, a brevet maj. and capt. of the 3d regiment, U. S. infantry.

MORRIS, Lewis, 1671–1746; b. N. Y.; son of an officer in the army of Oliver Cromwell, who in 1672, settled where Morrisania now is on a farm of 3,000 acres. He ran away from home when a lad, and visited Virginia and the West Indies. Returning he studied law, and at the age of 21 was a judge of the superior court of New Jersey, a member of the council, and afterward member of the assembly. He became chief-justice of New York and New Jersey; state councilor, 1710–38; acting governor, 1731; and governor of New Jersey in 1738, retaining the office until his death.

MORRIS, Lewis, 1726–98; b. N. Y.; educated at Yale college, where he graduated in 1746. He farmed the family estate at Morrisania, but in 1786 sold it to his brother Gouverneur. He was a member of the provincial congress of 1775; and on the close of the session was dispatched on a mission to gain the adherence of the Indians in the coming struggle. He was again in congress in 1776, and was one of the signers of the declaration of independence. His property was seized by the British, and the family homestead demolished as reprisal for this act. Mr. Morris was a member of the legislature of the state of New York after the organization of the state government.

MORRIS, Lewis O., d. 1864; son of brevet maj. L. N. Morris; was a second lieut. in the U. S. army, and served in the war with Mexico. In 1861 he was in command of a battery stationed in Texas, and on the outbreak of hostilities, though summoned to surrender it to the confederates, refused to do so. In 1862 he was appointed col. of the 113th N. Y. volunteers; and shortly after, being stationed at Washington, his command was converted into a heavy artillery regiment, and in the spring of 1864 was attached to the army of the Potomac and participated in all the engagements of the campaign. He commanded a brigade at the battle of Cold Harbor, June 3, 1864, where he was shot at the head of his men.

MORRIS, Richard, LL.D., b. England, 1833; educated at St. John's college, Battersea. He became lecturer on the English language and literature in King's college school in 1869, and took holy orders in 1871. Four years later he was made headmaster of the royal masonic institution for boys in 1875. He has edited a number of publications for the early English text society, the Chaucer society, and the philological society; and was elected president of the latter in 1874, and is still a member of its council. Besides his editions of early English works, he has published *The Etymology of Local Names*, 1857; *Specimens of Early English*, 1867; *Historical outlines of English Accidence*, 1872; *Elementary Lessons in Historical English Grammar*, 1874; and *Primer of English Grammar*, 1875.

MORRIS, Robert, 1734–1806; b. in Lancashire, England; received a common school education only; was brought to this country by his father, and when about 15 years old entered the counting-house of Charles Willing, a Philadelphia merchant, and continued in the firm for many years, gradually rising by his integrity and ability until, in 1754, he was made a partner. When the revolution broke out he had already acquired a very large fortune, and the firm was second to none in the state in the extent of its business. He at once ardently sided with the patriot party, and by assenting to the non-importation act, 1765, sacrificed great trade advantages for sake of principle. In 1775 he was a delegate to the continental congress, and was a signer of the declaration of independence, though he had opposed its adoption as ill-timed. He served for several years on the committee of ways and means, and in that capacity was of immense assistance to the cause not only by his sagacity as a financier, but by his personal credit. More than once he rescued congress from a seemingly fatal crisis by borrowing money on his own name and that of his firm; the $1,500,000 which enabled Washington to carry out his last campaign against Cornwallis was raised by his exertions and on his own notes. From 1781 to 1784 he was superintendent of finance and was vested with complete control over the monetary affairs of the country. Here again he several times used his reputation as a man of great wealth to rescue the treasury from embarrassment. The bank of North America was founded in Dec., 1781, with a capital of $400,000 and was of great use to the government. The looseness of the confederated bond between the states and the general poverty of the people rendered the financial management peculiarly difficult and vexatious; and it was with a sense of relief that, in 1783, Morris resigned his office. Pressed to remain he reluctantly continued his duties until the end of 1784, when a commission was appointed to examine his accounts, and he issued an address, explaining his measures and promising to fulfill all obligations undertaken by him on behalf of the government. In 1786–87 he was influential in procuring the re-establishment of the North American bank, the charter having been repealed. He was a member of the constitutional convention of 1787, and was afterward U. S. senator from Pennsylvania. He was more than once offered the office of secretary of the treasury, but refused and suggested the name of Hamilton. Unfortunate land speculations proved disastrous to his wealth; and on May 7, 1806, the man who had controlled the finances of a rising nation and by his personal exertions saved it from bankruptcy, died in a debtor's prison.

MORRIS, Robert Hunter, d. 1764; son of governor Lewis Morris; was chief-justice of New Jersey, and for 26 years a member of the council. In 1754 he was lieutenant-governor of Pennsylvania, and held the office two years.

MORRIS, Staats Long, 1728–1800; b. N. Y.; grandson of governor Lewis. He joined the British army, and in 1756 held the rank of capt.; was made lieut.col. of the 89th Highlanders, and was present at the siege of Pondicherry in India in 1761. He was brig.gen. in 1763; married the duchess of Gordon; was a member of parliament; promoted to maj.gen. in 1777, and to gen. in 1786; in 1797 was appointed governor of Quebec.

MORRIS, Thomas, 1776–1844, b. Va.; removed in 1800 to Ohio, where he began the practice of law. In 1809 he became an associate justice of the state supreme court. After a service of several terms in both branches of the state legislature, he was elected a member of the U. S. senate. Though a democrat, he did not act with the majority of his party, but was opposed to the extension of slavery, and defended the right of the opponents of slavery to have their petitions considered by congress. His independent attitude estranged his party, and lost him his seat at the next election. In 1844 he was the candidate for vice-president on the "liberty" ticket with James G. Birney. His *Life and Writings* were published by his son, rev. B. F. Morris, in 1855.

MORRIS, Thomas A., D.D., 1794–1874; b. Kanawha co., Va.; was licensed as a preacher of the Methodist Episcopal church in 1814, and joined the Ohio conference in 1816. His itinerant labors were in Ohio, Kentucky, and Tennessee, until 1834, when he was elected editor of the *Western Christian Advocate* at Cincinnati. In 1836 he was elected bishop. Ill health for several years before his death had withdrawn him from active duty. He published sketches of *Western Methodism* and some sermons. He was distinguished for excellent judgment, and made an able presiding officer.

MORRIS, WILLIAM, one of the most powerful of contemporary English poets, was b. near London in 1834, and educated as a painter. In 1863 he associated himself with some others to found an establishment for designing and manufacturing decorative furniture, wall-paper, stained glass, and the like, and has since been actively engaged in this business. His chief poems are *The Defense of Guenevere* (1858), *Jason* (1867), *The Earthly Paradise* (1870), *Love is Enough* (1873), a translation of Virgil's *Æneid*, and *Sigurd the Volsung* (1877). He has also published translations from the Icelandic.

MORRIS, WILLIAM WALTON, 1801–65; b. N. Y.; educated at West Point. He served, with distinction, through the Seminole war, and was with gen. Taylor in the Mexican war. He was at Palo Alto and Resaca de la Palma, and was made military governor of Puebla, in 1847. He was stationed at fort Kearney, Nebraska, 1853, and was in command of fort McHenry, Baltimore, during the rebellion. He was brevetted maj. gen. the day before his death.

MORRISA'NIA, a village of New York, in Westchester co., on the New York and New Haven railway, and about 10 m. n. of New York. It has been mostly built within the last twenty years, and is chiefly occupied by persons doing business in New York. Pop. '70, 19,609.

MORRISANIA (*ante*), was annexed to N. Y. co. in 1874. It is a station on the New York and Harlem railroad, and connected with New York by an iron draw-bridge. It contains numerous schools and an academy, 20 churches, a convent, and many fine residences. It has had a rapid growth.

MORRIS-DANCE, a fantastic dance, commonly practiced in the middle ages, and not yet wholly forgotten in England. Its origin is ascribed to the Moors. The chief performer was the *hobby-horse,* so called from the light frame of wickerwork which was fastened round his body, and supplied with a pasteboard head and neck, so as to give him the appearance of a man on horseback. Bells were also attached to his ankles, and the great art consisted in so moving the feet as to produce a rude kind of concord. The other principal actors, after a rude fashion, personified the characters of Maid Marian, the Queen of the May, Robin Hood, Friar Tuck, the Fool, etc.; and the performance was accompanied by rude music, and the clashing of swords and staves, and was the chief amusement at parochial festivals.

MORRIS ISLAND, situated at the entrance to the harbor of Charleston, S. C., 3¼ m. long. It was connected with the very first overt act in the war of the rebellion, a battery at Cumming's Point, the northern end of the island, being concerned in the capture of fort Sumter, April 12–13, 1861. It was made one of the line of defenses of Charleston, fort Wagner and other batteries being erected upon it, and proved to be of great importance to the confederates. Early in July, 1863, the union forces made a descent on the s. extremity of the island and effected a landing; but the efforts immediately made to capture fort Wagner proved unsuccessful. It having been concluded to reduce this important work by regular siege, parallels were opened and approaches made, beginning July 9, with the first parallel. Five parallels were established between that date and Aug. 26; and, with the assistance of the navy, a fierce attack was opened on Sept. 5, under cover of which the approaches were pushed forward, and on Sept. 6 the fort was evacuated. The island was now employed in the siege of Charleston by the union forces, by placing powerful ordnance of long range on the n. end of the island, and using these effectually to throw projectiles into the city, 4 m. distant.

MORRISON, a co. in central Minnesota, bounded on the w. by the Mississippi river, on the n. by the Crow Wing river, drained by the Platte and Swan rivers and other streams: 1175 sq. m.; pop. '70, 1681—1113 of American birth. The surface is largely prairie, with a heavy growth of timber. The soil is rich, and produces large crops of Indian corn, wheat, oats, grass, and potatoes. Co. seat, Little Falls.

MORRISON, a t. in Illinois, on the Chicago and Northwestern railroad; pop. '70, 2,500. It is pleasantly located on Rock creek, and is the seat of Whiteside co., 124 m. from Chicago and 14 m. e. of Clinton, Iowa. It contains a court-house, 7 churches, a national bank, and 2 weekly newspapers, and derives its importance mainly from the rich agricultural and stock-raising country surrounding it. The leading industries are the manufacture of carriages, wagons, and agricultural implements.

MORRISON, ROBERT, D.D., the founder of Protestant missions in China, was b. of Scottish parentage at Morpeth, in Northumberland, Jan. 5, 1782. He studied at one of the Independent colleges, and 1805 he was sent to Macao and Canton by the London missionary society, to learn the Chinese language, and to translate the Bible into it. He reached Canton in September, 1807, and in the course of a year was appointed translator to the East India company's factory at Canton. By the year 1814 he had completed the translation and printing of the whole of the New Testament. Four years later, by the help of Mr. (afterwards Dr.) Milne, he had done the same with the Old Testament; and in 1822 he completed and printed his great *Chinese Dictionary* at an expense to the East India company of £15,000. In 1816 he acted as interpreter to Lord Amherst. In 1818 he established an Anglo-Chinese college at Malacca for English and Chinese literature, and for the propagation of Christianity. After a residence of 17 years in China, he returned to England in 1824, and brought with him a collection of 10,000 books in the Chinese tongue. In 1826 he returned to China. In 1834 he accompanied Lord Napier to Canton as interpreter, and died there Aug. 1. Besides the works already mentioned, he is author of *Horæ Sinicæ* (Lond. 1812), being translations from the popular literature of the Chinese; a *Chinese Grammar* (Serampore, 1815), and *Chinese Miscellany* (1825). In 1839 his widow published *Memoirs of the Life and Labors of Robert Morrison.*

MORRISON, WILLIAM, 1785–1866, b. Canada; was apprenticed to the New York fur company in 1802, and was afterwards admitted as a partner. During the twelve years of his service with the company, he explored a large part of Wisconsin and the northwest, and he is said to have been the first white man to find the source of the Mississippi. From 1815 to 1826 he managed the fur business of John Jacob Astor.

MORRISTOWN, a village of New Jersey, on the Whippany river, and the Morris and Essex railway, 23 m. w. of New York, on an elevated plain, commanding a fine prospect. It has a court-house, 2 banks, 8 churches, and several literary institutions. Pop. '70, 5,674.

MORRISTOWN (*ante*), a t., the capital of Morris co., N. J., on the Morris and Essex division of the Del., Lack., and Western railroad, 32 m. w. by n. of New York. It was the head-quarters of the American army during the winters of 1776–77 and 1779–80. The traces of an old fort still exist back of the court-house, and the house occupied by Washington, having long remained in the ownership of the Ford family, is now the property of the state, and has been made a depository for many interesting revolutionary relics. The town is built on a plateau which affords beautiful views of the surrounding valleys and hills. As originally laid out there was a common in the center that was called "the green," from which in process of time the grass disappeared. After many fruitless efforts to improve it, a satirical effusion, calling it "an invisible green," led to its being inclosed and adorned. It now contains a monument to the memory of the soldiers who gave their lives to the defense of the union. The town and its environs furnish pleasant summer residences for citizens of New York, and homes for many whose business affairs call them to that city every day. Among the public buildings are a handsome court-house, a public library and lecture hall, churches of different denominations, two of them Presbyterian, the first of which is venerable among the older churches of the land, and the second admirable in the beauty of its modern architecture. In the vicinity is the new state asylum for the insane, having one of the largest and best arranged buildings in the country. Its entire length is 1243 ft., and its greatest depth, from the front of the main center to the rear of the extreme wings, 542 ft. It is built in an ornamental style of architecture, principally of light granite quarried on the spot. It has accommodations for 1000 patients, and its grounds contain more than 400 acres. Its cost was more than two millions of dollars.

MORRISTOWN, a village in e. Tennessee, a junction of the East Tennessee, Virginia, and Georgia railroad, and the Cincinnati, Cumberland Gap, and Charleston; pop. '70, 1000. It is situated on the s. bank of the Holston river, and is the seat of 2 colleges, 1 a female institute. It has public schools, 6 churches, a national bank, 2 weekly newspapers, and 3 hotels. It is in the center of a fertile agricultural district, which contains extensive quarries of variegated marble. The leading industries are the manufacture of flour, and of sashes, doors, and blinds.

MORROW, a co. in central Ohio; 400 sq.m.; pop. '80, 19,073—18,461 of American birth. The surface is undulating, and the soil fertile, producing good crops of Indian corn, oats, wheat, and flax. Other staples are wool and maple-sugar. Much of the surface is covered with forests, and there is an abundance of sugar-maple trees. There are freestone and sandstone quarries. Vernon river, Walnut creek, and the e. fork of the Whetstone river flow through it. It is on the Cleveland, Columbus, Cincinnati, and Indianapolis railroad. Co. seat, Mount Gilead.

MORROW, JEREMIAH, 1771–1862, b. Penn.; settled in the northwest territory in 1805. He was a member of the convention in 1802 which framed a constitution for the new state of Ohio. He represented that state in the lower house of congress 1803–13, and in the senate 1813–19. He was elected governor in 1822, and served till 1826. Soon afterwards he became commissioner of canals; and 1841–43 he was again in congress.

MORS, the largest island in the Lymfiord, s. of Jutland, in the kingdom of Denmark, 24 m. long, 11 m. broad; pop. 6,000. About two-thirds of the surface is a high table-land, with fertile soil; the remainder comprises bogs and marshes. The chief town is Nyekiobing, on the e. coast of the island.

MORSE, EDWARD SYLVESTER, PH.D., b. Me., 1838; educated at the Lawrence scientific school of Harvard university. In 1859 he became an officer of the Cambridge museum of comparative zoölogy, and in 1867 he was elected by the Boston society of natural history its curator of mollusca. He has been professor of comparative anatomy and zoölogy at Bowdoin college, and lecturer on zoölogy at Harvard. He is an officer of the Peabody academy at Salem, Mass., where he resides. He has written many papers, and delivered lectures on scientific subjects, and has published *An Elementary Text Book of Zoölogy.*

MORSE, Jedidiah, d.d., 1761–1826; b. Conn.; graduated at Yale college in 1783; in 1784 published at New Haven a small geography, which was followed by a series of geographies and gazetteers of the United States from materials collected by traveling and correspondence with J. Belknap, historian of New Hampshire, and others. These works were very popular and had a large circulation. They were published in England, and translated into French and German. He entered the ministry in 1785; was tutor in Yale in 1786; pastor of the First Church (Congregational) in Charlestown, Mass. 1789–1820. At the close of his pastorate, having received a commission from Mr. Calhoun, secretary of war, he spent two winters in visiting some Indian tribes, of which a report was published in 1822. He was editor of the *Panoplist* 1806–11, and one of the founders of Andover theological seminary. He published, besides his geographies, *A Compendious History of New England; Annals of the American Revolution; An Appeal to the Public on the Controversy respecting the Revolution in Harvard College;* and several sermons and addresses. In 1794 he received the degree of d.d. from Edinburgh. Dr. Morse, who was eminent in the New England ministry, was much engaged in religious controversy, maintaining the old evangelical faith in New England against the Unitarians.

MORSE, Richard Cary, 1795–1868; son of Jedidiah; b. Charlestown, Mass.; studied at Phillips academy, Andover, and graduated at Yale college in 1812. After graduating, he spent a year in New Haven as an amanuensis in the family of president Dwight; studied theology at Andover seminary; entered the ministry in 1817. Convinced that he was not fitted for the ministry he retired from it, and engaged with his father in the preparation of his geographies; in 1823 he united with his brother Sidney in establishing the *New York Observer*, of which he was associate editor and proprietor during the remainder of his life. He wrote largely for its columns, especially translations from French and German. In 1858 he retired from active life. He died while abroad at Kissingen, Germany.

• **MORSE**, Samuel Finley Breese, ll.d., etc., American artist and inventor, was the eldest son of rev. Jedidiah Morse, d.d., geographer, and was b. at Charlestown, Mass., April 27, 1791. He graduated at Yale college in 1810, and visited England with the American painter, Washington Allston, to study painting with him and Benjamin West. In 1813 he received the gold medal of the Adelphi society of arts for his first effort in sculpture, the "Dying Hercules." Returning to New York in 1815, he became the first president of the national academy of design, and was appointed professor of the arts of design in the university of the city of New York. He did not give his entire attention to art, but was interested in chemistry, and especially in electrical and galvanic experiments; and on a voyage from Havre to New York, in 1832, he conceived the idea of a magnetic telegraph, which he exhibited to congress in 1837, and vainly attempted to patent in England. His claims to priority of invention over prof. Wheatstone in England have been the subject of considerable controversy. See Telegraph. He struggled on with scanty means until 1843, when. as he had almost yielded to despair, congress, at midnight, and the last moments of the session, appropriated 30,000 dollars for an experimental line between Washington and Baltimore. For his telegraphic inventions, Morse was rewarded by testimonials, honors, orders of nobility, and wealth. Several European states joined in presenting him a purse of 400,000 francs, and banquets were given him in London and Paris. The well-known recording instrument is his invention. The origination of submarine telegraphy is also claimed for Morse. He died April 2, 1872.

MORSE, Samuel Finley Breese, ll.d. (*ante*). Prof. Morse probably had his interest first awakened in the subject of electro-magnetism, through conversations with prof. J. Freeman Dana, who lectured in New York on that subject in 1826–27, and who was a personal friend. Morse first conceived the idea of the telegraph while on board the packet-ship *Sully*, on his way from Europe to America in 1832, and was led up to the conception by the then recent discovery in France of a method for obtaining the electric spark from the magnet. This fact was established by the testimony of passengers on board the ship, and by his own evidence, and that of drawings made by him at the time. Before the close of the year 1832 a portion of the apparatus which he had devised had been constructed in New York, but it was not until three years later that, in a room in the New York university building, in that city, he showed the telegraph operating with half a mile of wire. In Sept., 1837, he made a public exhibition of his discovery, and in that year filed his caveat at Washington. No tangible result following his appeal to congress for aid during that session, prof. Morse visited Europe with the hope of enlisting the interests of foreign governments in his invention. In this hope he was unsuccessful, and he returned to New York, where, and in Washington, he struggled under serious privations during the four years which elapsed before he obtained congressional aid. And after this aid had been granted, and through the means thus afforded he had succeeded in establishing a working telegraph line, he did not obtain his full reward for the service he had accomplished without tedious and expensive litigation with parties who contested his claims. The number and character of the honors heaped upon prof. Morse on account of his invaluable invention have probably never been equaled in the case of any other American. He received gold medals from Prussia, Austria, and Würtemberg. France conferred upon him, through the emperor Napoleon, the cross of the chevalier of the legion of honor; Denmark made him knight commander of the first class of the Danebrog, and Spain, knight commander of the order of Isabella the Catholic; from Italy he received the cross of the order of Saints Maurice and Lazarus, and from Portugal that of the order of the tower and the sword. Turkey bestowed upon him, at the hands of the Sultan, the decoration of the *Nishan Iftikar*, and Yale college conferred upon him in 1846, the degree of LL.D. Public banquets were given him in London, Paris, and New York, and in June, 1871, a bronze statue of him was unveiled in Central Park.

Prof. Morse set up the first daguerreotype apparatus, and took the first daguerreotypes in America; he also laid the first submarine telegraph line (in New York harbor, in 1842); and from him, in a letter to the secretary of the treasury of the United States in 1843, seems to have come the first suggestion of an Atlantic telegraph. His death occurred about three months after his last public act—the unveiling of the statue of Benjamin Franklin, in Printing-house square, New York.

MORSE, SIDNEY EDWARDS, son of Jedidiah; 1794–1871; b. Charlestown, Mass.; graduated at Yale college in 1811; studied law in Judge Reeve's school at Litchfield, Conn.; established in 1815 the *Boston Recorder*, a weekly religious newspaper, and was for fifteen months its sole editor and proprietor. In 1817, in connection with his brother, he invented and patented the flexible piston pump. In 1820 he published a small geography, and in 1822 a larger one which was a text-book in several American colleges. In 1823 he united with his brother, Richard C., in establishing the *New York Observer*, now the oldest religious newspaper in the state. In 1839, jointly with Henry A. Munson, he produced superior map-prints by a new art which he called cerography. The first application of the art was in the preparation of maps for a school geography written by himself, of which 100,000 copies were printed and sold the first year. The process of cerography has not been disclosed. He continued the senior editor and proprietor of the *Observer* until 1858, when he disposed of his interest to the Rev. Dr. S. I. Prime, for many years his associate. Much of his time during the last years of his life was devoted to the invention of the cathometer, for deep-sea soundings, and he was preparing an essay on the subject at the time of his death.

MORSE, WALRUS, or SEA-HORSE (*trichecus*), a genus of amphibious mammalia of the family *phocidæ*, agreeing with the rest of that family—the seals—in the general form of the body and limbs, but widely differing from them all in the head, which is remarkable for the enormous development of the canine teeth of the upper jaw, and the tumid appearance of the muzzle caused by the magnitude of their sockets, and by the thickness of the upper lip. These great canine teeth form two tusks directed downwards, and the lower jaw becomes narrow in front, so as to pass between them. There are no canine teeth in the lower jaw. The incisive teeth are small, six in the upper jaw, and four in the lower, mostly disappearing from adult animals. The molars—at first, five on each side in each jaw, but fewer in the adult—are simple and not large; they have the crowns obliquely worn. The nostrils, as if displaced by the sockets of the tusks, open almost upwards, at some distance from the muzzle. The eyes are small, and the ears have no auricle, or, in popular language, there is no ear.—There is only one known species (*T. rosmarus*), sometimes called the ARCTIC WALRUS, an inhabitant of the Arctic seas and of the colder parts of the north temperate zone. It sometimes attains a size greater than that of the largest ox, and the tusks are sometimes 2 ft., or even 30 in. long; but the ordinary length of the tusks is only about one foot. The morse is a gregarious animal, and is often seen in great herds, which sometimes leave the water to rest for a while either on the ice or on the land, where, however, their movements are very awkward and clumsy, and the hunter assails them with much greater prospect of success than in the water. Hundreds have thus been killed at one time, although the adventure is not without danger, as they must be assailed with spears, their hide being thick enough to resist even a rifle bullet. The morse uses its tusks for protecting itself or young from attack, for combating with its enemy the polar-bear, for aiding it in climbing upon ice; but principally, it is supposed, for tearing sea-weed from submarine rocks; that being, there is every reason to think, the principal food of the animal, although it is supposed also to prey on mollusks, crustaceans, and other marine animals. The female morse shows great affection for her young, and will defend it to the last extremity; the young also remains beside the mother even after she is killed. When one of these animals is attacked, the rest of the herd—at least if in the water—hasten to its assistance. The morse is very capable of being tamed.—It is much sought after by the inhabitants of the most northern parts of the world for its skin, thongs of which seem to have been generally used in former times for ropes and cables—esteemed so valuable, that the Finlanders paid tribute in this article; whilst its oil—not very abundant—is employed like seal oil; and the tusks are very much valued as ivory, being superior in compactness to those of the elephant. The flesh is coarse, but is eaten by the Esquimaux. The young morse has not large tusks like the adult.

The morse has occasionally been seen on the British coasts, probably transported on icebergs from the north

The name morse is from the Russian *mors* or Lapp *morsk*. The name *walrus* is Norwegian (*hval-ros*, whale-horse). Another Norwegian name is *rosmar*, supposed to be from the Teutonic *ros*, horse, and *mar*, the sea.

MORSHANSK, a t. in the government of Tambov in Russia, 56 m. n. of Tambov, is situated on a feeder of the Oka. Pop. '70, 19,800. Morshansk is the port for shipment of corn, the shipments annually amounting in value to 5,000,000 rubles. There is also a large market for the cattle and sheep of the s.e. provinces, the average annual supply being 20,000 cattle and 100,000 sheep; also for melted grease, of which 1,500,000 rubles' worth is sent yearly to St. Petersburg and Moscow. The trade of the town itself is of little importance, the chief establishments being soap boileries, flour mills, and sail-cloth manufactories.

MORTALITY, LAW OF. While there are few future events the date of whose arrival is more uncertain than that of death to any one man, on the other hand, the average duration of a multitude of human lives is found to be in accordance with a law which operates as surely as that of gravitation. If it be asked how many lives must we have before we can depend on obtaining from them a duration equal to the general average the only answer that can be given is, that the more we have the more nearly must we approach to this result; the fluctuation ultimately becoming so small as to be practically of no effect. So long ago as early in the 17th c., a certain John Graunt of London published what he called *Natural and Political Observations on the Bills of Mortality*. This work has been called "the earliest movement in economical arithmetic, and the closest approximation to the data on which life assurance is founded." About the same time, sir William Petty gave to the world many curious calculations and speculations on the same subject. In 1693 Dr. Halley published the Breslau tables of mortality, and this was the first work which really raised the subject to the rank of a science. Halley's speculations had, however, been preceded by those of Pascal in France, and of De Wit in Holland; and the latter famous man is probably entitled to be considered as the first who has applied the doctrine of probabilities to the valuation of life in the question of annuities. His treatise will be found in the second volume of the *Assurance Magazine*. Halley's tables are printed in the *Philosophical Transactions* for 1693, No. 196. In 1713 J. Bernouilli's important work was published; and in 1742 Dr. Price, availing himself of the principles laid down by Halley, and of data previously published by "John Smart of Guildhall, London, gent.," gave tables of mortality for London. In 1746 M. Deparcieux published at Paris his *Essai sur les Probabilités de la Vie Humaine*, in which he gave six valuable tables. In one of these, computed from the registers of different religious houses, it was shown, for the first time, that female life is superior to male. In 1770 appeared the first edition of Price's *Observations on Reversionary Payments*. The speculations of Buffon, Simpson, and De Moivre about the same time were of much importance. Mortality tables are tables showing the operation of the law of mortality. The correct method of framing them is by analyzing and collating accurate and sufficiently extensive statistics of life and death. They enable us to form a fair estimate of the number of human beings who will die at the end of a given period out of a given number alive at the beginning of it; and hence, the chance of life and death to the individual, and the mean duration of life at any age. Tables showing the mean duration of life have been constructed in two ways: 1st, From statistics of deaths alone; and 2d, From statistics of life and death. By the first plan, they would be deduced as follows: Suppose, on searching a parish register, that we found recorded 100 deaths of children in their first year, we should assume that, on an average, ½ a year of life would have fallen to each. This gives 50 years of life among 100. If we found that 60 had died in their second year, assigning one year and a half to each, we should have $60 \times 1.5 = 90$ years among the 60: and so on for every age up to the oldest on the register. The sum of all the years enjoyed, divided by the numbers who have enjoyed them, will give the mean duration of life from birth; and the sum of all the years enjoyed after a given age, divided by the numbers who have enjoyed them, will give the mean duration at the given age; in both cases as nearly as the data enable us to give it; but the data are insufficient. Suppose we found by a register for 1873 that 100 children had died in their first year and one man in his 96th, it is plain that, to make this ratio a fair one, there ought to have been as many births in 1778 as in 1873. If there have been only half as many born at the former date as at the latter, then we must put two lives into the calculation to make it correct; and we must proportion our results similarly at all intermediate ages. Again, suppose four deaths at age 23 to be registered, we cannot tell how many of those born in 1850 may have emigrated from one parish, nor do we know how many born elsewhere in that year may have come into it. For the rule and formula for obtaining the mean duration of life under the second method, which is an absolutely certain one, see LIFE, MEAN DURATION OF. The following are the tables now most generally used by assurance and annuity offices in this country: I. The Northampton (Dr. Price's). This table was framed by Dr. Price from the register of burials in the parish of All Saints, Northampton, 1735–80. Being constructed on deaths alone, it has, as was to have been expected, proved faulty. It gives the probabilities of life too low at the younger and middle ages; and those offices which still use it—and there are a good many—have some difficulty in keeping themselves right. II. The New Northampton (Nos. 1 and 2). These tables were constructed by Dr. Farr. See Eighth Report of the Registrar-General for England. pp. 277–348. No. 2 is based on the deaths alone in Northampton during the seven years 1838–44. In its results it agrees almost exactly with that of Dr. Price. No. 1 was deduced from a comparison of the deaths during 1838–44 with the census returns of 1841. It differs widely from No. 2 and from Dr. Price. By the two latter, the mean duration of life is respectively found as 24.88 years and 25.18 years. By No. 1 it is 37.5 years. III. The Carlisle. This table was constructed from observations made by Dr. Heysham at Carlisle, 1780–87. It is now generally understood that the mortality in towns is understated at ages 15–35, owing to the immigration of healthy men and women from the country. Again, the female population of Carlisle was excessive during the period in question, and the extent of the observations was limited. Owing to these facts, this table gives rather too low a rate of mortality, and is a little irregular in its graduation. In a table prepared by W. T. Thomson, esq., in a Report on the Ministers' Widows' Fund of the Church of Scotland, 1861, he shows that the lives of the Scotch clergy are about half a year better up to 44 than the Carlisle; at 45, they are equal; and at 45 to 80 they are half a year worse. Thereafter they vary. The widows are half a year better up to 61, equal at 62, and nearly so to the end. Probably the Carlisle gives a fair mortality rate for a healthily circumstanced population. IV. The Government. These were computed by Mr. Finlaison on the lives of 22,000 nominees for government annuities. They are chiefly important as giving a view of the value of female life, but this view is one which differs widely from those given either by the "Experience" or by the "English" table. At age 20, for instance, the mean duration of female life is, by the Government table, 5¼ years more than the male; by the Experience, it is 4 years less. In some measure this wide divergence may perhaps be accounted for by the fact that the Government results are deduced from annuitants, the Experience from assured lives. The experience of late years has, however, led to some modification in the relative values of male and female life in government tables. V. The English (Nos. 1, 2, and 3). No. 1 is deduced from the living by the census of 1841, and from the deaths at corresponding ages in the same year. See 5th and 6th Reports of the Registrar-General for England, where the tables will be found, and their construction explained. No. 2 is deduced from the living in 1841, and from the deaths in the seven years 1838–44. No. 3 is deduced from the population in 1841 and in 1851, and on the deaths for the 17 years 1838–54; male and female life being calculated separately and in combination. These "English" tables probably give the results of the average mortality of England more correctly than any others which we have. They are the result of enormous labor on the part of Dr. Farr. The observations were taken on the plan recommended by prof. de Morgan and Mr. Griffith Davies. VI. The Experience. These were prepared by a committee of eminent actuaries on the data afforded by the combined experience of 17 life assurance offices. The objections to which they are liable are, that certain lives, having been more than once assured, have appeared twice or oftener as elements in the calculations; that the average term over which the observation of the offices extends is only eight and a half years; and it is probable that the mortality which will prevail in assurance societies when they have reached maturity is somewhat understated. See letter by Dr. Farr in Appendix to 10th Report of Registrar-General, p. 11. Further, the data for old ages were deficient, and this of course affects the whole. Many curious results are brought out by this table. It shows that "town" *assured* life is superior to "country;" that female *assured* life is on the whole inferior to male; and that Irish life is worst of all. At age 20, "town" mean duration is 41 years, 2 months; country, 40 years, 4 months; Irish, 34 years, 11 months. The observations of the Standard assurance company do not, however, bear out these results; and they are doubtless so largely affected by the elements of *care in selection* as to render it impossible to found on them any conclusion of practical value. A new set of "Experience" tables was published in 1872, based on the mortality experiences of twenty offices, ten English and ten Scotch. They do not show any widely different results from the former Experience tables. These form a very valuable set of tables. They give the results of English and Scotch experience united, and of Scotch separately.

In all tables deduced from the experience of assurance and annuity societies, the fact of *selection* must not be lost sight of, either in using them for the sake of comparison, or as the basis of other tables. Actuaries, however, seem to be generally of opinion that the selection exercised by assurance societies does not really lower their rates of mortality below the general average; without selection, their rate would be above the general mean; for, it will be observed, that the public are continually selecting against the offices by offering inferior lives, and good lives often surrender their policies, while lives which have become bad hardly ever do so. Again, the value of medical examination gradually disappears, and in ten years at most it is quite lost. Five to seven years is indeed now held by the assurance offices to exhaust its value. See Minutes of the House of Commons' Committee on Assurance Associations, 1853; and Life-Contingency Tables by E. J. Farren, pp. iii.–xiii. Though female life is, as a whole, undoubtedly superior to male, yet as there are more critical periods in it, it is probable that the public may more frequently select it than male life against the societies. A valuable report on the Madras military fund (London, 1863) gives tables constructed on the mortality rates prevailing among the officers, wives, and widows interested in the fund. As they have been prepared by eminent men on very ample data, they will probably be very valuable to societies transacting business in India. The following is a view of the mean duration of life, at the beginning and at each decennial period, according to some of the tables mentioned above:

TABLE SHOWING THE "MEAN DURATION" OF HUMAN LIFE, ACCORDING TO VARIOUS AUTHORITIES.

Age.	NORTHAMPTON.		CARLISLE.		GOVERNMENT.		ENGLISH LIFE TABLE.—DR. FARR.						Experience of Twenty Offices.	Age.
	Male and Female combined. Dr. Price.		Male and Female combined. Dr. Heysham.		Female. Finlaison, 1829.		Male.		Female.		Male and Female combined.		Male Life.	
	Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.	Yrs.	Mths.		
0	25	2	38	9	55	6	40	2	42	2	41	2	....	0
10	39	9	48	10	51	1	47	1	47	10	47	5	50.29	10
20	33	5	41	6	44	0	39	11	40	10	40	4	42.03	20
30	28	3	34	4	37	7	33	2	34	3	33	8	34.68	30
40	23	1	27	7	31	1	26	6	27	9	27	2	27.40	40
50	18	0	21	1	24	4	20	0	21	1	20	7	20.81	50
60	13	3	14	4	17	4	13	7	14	5	14	0	13.88	60
70	8	7	9	2	11	0	8	6	9	0	8	9	8.50	70
80	4	9	5	6	6	6	4	11	5	2	5	1	4.72	80
90	2	5	3	3	2	10	2	9	2	10	2	9	2.36	90
100	0	0	2	3	0	6	1	6	1	6	1	6	(at 95) 0.96	100
	Both Sexes.		Both Sexes.		Female Life.		Male Life.		Female Life.		Both Sexes.			

In the present article we have considered the law of mortality chiefly as it bears on insurance and other monetary transactions. The wider view of the subject, as varying with occupation and in different ages and countries, will be illustrated under the head of VITAL STATISTICS.

MORTAR. See CEMENTS.

MORTAR, a piece of artillery which differs from a cannon in the large diameter of its bore in proportion to its length, and in the circumstance that it is usually fired at a considerable angle, so that the projectile may strike the object aimed at in a direction more or less vertical. The object for which mortars are intended is the discharge of live shells (q.v.) or carcasses. As the projectile has a large diameter, and, except in rare instances, a very great range is unnecessary, a comparatively small charge of powder is requisite. To give this its utmost power and concentration, it is confined in a hemispherical chamber at the lower end of the bore, but of less diameter. The shell completely closes this chamber; and when the explosion ensues receives its full force on its center. In the British service the ordinary mortars range in diameter of bore from 5 to 18 inches.

Larger mortars have, however, been tried at times, as at the siege of Antwerp citadel in 1832, when the French brought one of 24 inches bore to the attack. This monster, owing to its unwieldiness and other causes, was a failure. Larger still than this, though perhaps more manageable, is Mr. Mallet's great 36-inch mortar, constructed in 1855, of iron parts welded together, and now at Woolwich, rather as a curiosity than for use. As loaded shells are of immense weight, so heavy, indeed, as in larger calibers to involve the apparatus to deposit them in their places, and the mortar is fired at high elevations, the recoil is so great and so nearly vertical that no carriage could withstand the shock; it is necessary, therefore, that the mortar should be mounted on a solid iron or timber bed, by the trunnions, which are placed behind the breech, and supported in front by massive blocks of wood. This arrangement renders the apparatus so heavy that mortars of large size are rarely used in field operations, their ordinary positions being in defensive or siege works, and in mortar-vessels.

More wieldy, however, are the Coehorn mortars, invented by the Dutch engineer of that name, for clearing the covert-way or ditch of a fortress. This mortar is sufficiently small to be managed by one man, and is accounted useful in siege or defense operations. The French use a similar Lilliputian ordnance under the denomination of pierriers, or stone-throwers. Small mortars are likewise constructed for mountain warfare; a mule carries the mortar, another the bed, and a third is laden with the projectiles. The use of mortars is diminishing at the present time, elongated shells of great weight being now thrown from rifled cannon.

MORTARA, a t. in n. Italy, 25 m. n.e. of Alessandria, and about 40 m. n.w. from the city of Pavia. It is in a fertile agricultural district, in the province of Pavia, on the Arbogna, and until recently was surrounded by fortifications and high walls, which have been removed and their place occupied by elegant villas; pop. '74, 7,408. It is the center of a number of railways and highways which give it some commercial consequence, and it contains military barracks, a theater, and good public schools. From the rice-fields in the vicinity there rises an unwholesome exhalation said to make the atmosphere unhealthy. In 774, when Charlemagne, having invaded Italy, besieged Pavia for eight months, the expedition resulting in the capture of Desiderius, one of the Lombards, and the downfall of their government, this city was the scene of a bloody battle, and was conquered only when its defenders were disabled by pestilence and famine.

MORTARA, EDGAR, a Jewish boy, whose case recently attracted great and painful interest throughout Europe. The facts are as follows: On June 23, 1858, signor Momolo Mortara, a manufacturer and wholesale merchant of cloth in Bologna, and by religious profession a Jew, returning home about ten o'clock at night, found his house in the possession of the police, who informed him that they had orders from padre Felletti, inquisitor-in-chief at Bologna, to carry off his son, Edgar, who had been surreptitiously baptized into Christianity by a Roman Catholic maid-servant. The inquisitor was waited upon by some friends of the family a little after midnight, who implored delay. He informed them that he was acting under the orders of the archbishop of Bologna, but consented to sist procedure till "next evening." The archbishop, however, was "absent," from the city, and next evening the papal cabineers entered the house and tore the child out of his father's arms." They carried him to Rome, where he was immured in a convent. The bereaved father immediately followed, obtained several interviews with cardinal Antonelli, and offered to prove that the servant who said she had baptized Edgar had turned out to be a worthless prostitute, living in sin with Austrian officers. The cardinal declined to interfere, on the ground that the case did not come under his jurisdiction, and recommended signor Mortara to apply to "the proper tribunals." After some weeks had passed, the child was removed to Alatri, whither his father and mother also went, and saw Edgar in a church among a number of priests, but had no opportunity of speaking to him. They returned to Rome, once more sought the presence of cardinal Antonelli, and prevailed upon him so far that he ordered the child to be brought back to the city, and allowed his parents several times to converse with him. These interviews are described as agonizing, and Edgar earnestly entreated his father and mother to take him home, but this of course was a hopeless request. He had been baptized, and baptism, no matter by whom administered, was an inviolable rite, which laid the Catholic church under the solemn obligation of protecting its son from the snares of parental infidelity. It dared not give him up. Signor Mortara and his wife had to go away without their child. The case soon became known throughout Europe, and excited great indignation, more particularly in England. The evangelical alliance drew up a protest, which was signed by the archbishop of Canterbury and above twenty other bishops, by a large number of peers, members of parliament, heads of colleges, and ministers of the gospel, by upwards of a hundred mayors and provosts, and by many other influential laymen. It was presented to lord John Russell. The British Jews presented another. Nothing, however, was effected by these efforts. Edgar Mortara remained, of his own choice, the result would seem to prove, in the hands of the Roman Catholic church authorities. He was educated for the priesthood, became an Augustine monk of the monastery Notre-Dame de Beauchêne, and preached his first sermon in 1874. The narrative, which created such excitement as echoed this boy's name over all the world, was at the time taken by the judicious as an *ex parte* statement; no authorized exposition of the facts, on the part of the Roman authorities, having ever been made public.

MORTAR-VESSEL, a class of gun-boat for mounting sea-service mortars, and in some cases provided with steam-power. The mortars are usually of the largest caliber—13 inch. To enable the mortar to be properly maneuvered, and to resist the recoil from the nearly perpendicular explosion of so great a piece of ordnance, the vessel has considerable breadth in proportion to her length. The mortar is slung amidships in a massive bed. The ancient form of mortar-vessel was the "bomb-ketch," convenient because of the length of deck without a mast. The present vessels originated during the Russian war, and were found serviceable at the bombardment of Sveaborg.

MORTGAGE, in English law, is the temporary pledging of land in security of a debt; and as the land cannot be delivered into the creditor's hand, he acquires a hold over it by a deed called an indenture, or deed of mortgage. The ordinary form of a mortgage deed resembles an absolute conveyance, but it contains a proviso that if the money borrowed is repaid within a certain time, then the mortgagee shall reconvey the land to the mortgagor or borrower. There is a mode of executing a mortgage without any deed, which is common with bankers and others who lend money. This consists in the borrower taking the title-deeds of his land to the banker, who keeps the deeds and lends money on the faith of them. This is called an equitable mortgage by deposit of title-deeds, but in point of fact is as good as any other mortgage. Mortgage deeds do not require in England to be registered, except in Middlesex and Yorkshire; and hence a person not unfrequently mortgages his property two or three times over, though the security is insufficient for all the debts. But in general this can only happen by the carelessness of one or other of the mortgagees, for the first mortgagee ought to have the title-deeds in his possession, and ought not to part with them, as they are his chief protection. A mortgagee can assign his mortgage security to another person, who thereupon stands in his shoes. If the money is not paid at the time originally appointed in the deed, then interest becomes due, and the deed is held as a security for both principal and interest. The remedy which the mortgagee has if the money is not paid at all, or not paid after due notice, is threefold. The mortgagee may exercise the power which the deed always contains to sell the estate and pay himself out of the proceeds; or the mortgagee may enter into possession and draw the rents and pay himself by installments. Or he may foreclose the mortgage, i. e., he commences a suit in the court of chancery, the effect of which is to allow a short time to the mortgageor to pay the debt, failing which the court will order it to be sold to satisfy the debt. Another remedy is for the mortgagee to sue the mortgageor for the money in an ordinary action. All these remedies may be pursued at one and the same time. Sometimes when a second and third mortagage are given over the same estate, which is often done when the estate is large compared with the money borrowed, it happens that the third mortgagee gets a prior title to the second mortgagee by buying up the first mortgage. On doing this he can tack the third mortgage on to the first by the doctrine known as the tacking of mortgages. As a general rule, if nothing is said, the mortgageor or borrower pays all the costs of the mortgage transaction. Until the estate is sold, or the security foreclosed, the mortgageor has what is called the equity of redemption, i. e., he can at any time, on payment of the debt, compel the mortgagee to reconvey the property to him. Mortgages in England are not a first-class security, and hence trustees who are not specially authorized by their deed or will to invest in mortgage security do it at their risk, it being assumed that the only investment which is absolutely safe is government stock. In Scotland mortgages are generally called bonds and dispositions in security, and form a higher and better security than in England, owing to there being a regular system of registration of deeds affecting land; and hence trustees are entitled to invest their funds there in mortgage security, which is considered as safe as government stock, and less liable to fluctuations of interest. In Scotland there is no such practice as mortgaging lands with banks by merely depositing the title-deeds. See Bond, Disposition in Security.

MORTGAGE (*ante*). In early times the only way to create a mortgage under the common law was to give livery of seizure of a freehold estate, thus passing the estate to the pledgee and his heirs. Afterwards a peculiar form of mortgage was created as an estate for years, the only right of the mortgageor being to pay the debt on the day specified, and thus clear his land of the obligation. If he failed to do this the estate was lost beyond recovery. The modern doctrine that time is not of the essence of the contract was established by equity courts and is founded on the distinction in Roman law between *hypotheca* and *pignus;* if the property was left in the hands of the mortgageor, the law of *hypotheca* was applied; if given over to the mortgagee, the law of *pignus*. While the common law considered a mortgage as a freehold estate, equity preferred to regard it as a pledge, and, as equity is supreme within its own domain, the entire law relating to the subject has now come under the control of its courts, and the old feudal ideas have given way. Three views then might be taken—that a mortgage is an estate possessing all the common-law incidents except that it is not absolute until foreclosure has been had; that it is a *quasi* interest of the mortgagee in the land without those incidents; or that it is a *pledge* (*hypotheca*) with the right of foreclosure. In every mortgage the estate and the debt or obligation are distinct, and the mortgagee cannot have seizin until the debt is due, though the decisions in some of the states seem to recognize a title before the time set for payment. Whether the assignment of the debt do or do not carry the mortgage with it is also a point on which the laws of the different states are not uniform. A conditional sale is often closely akin to a mortgage. In the latter there is a contract right of the creditor to obtain the land at some time after the non-payment of a debt which is a charge on the land; while in a conditional sale the contract stipulates that the vendor may repurchase at a fixed price; the existence or non-existence of intention to procure a loan or obligation making the distinction. The tendency of courts is to consider such an agreement a mortgage, if there be any doubt. Where there is clearly a conditional sale intended there is no equity of redemption in the vendor after the date specified. This, it will be seen, makes it of great importance to ascertain the true nature of the contract. A recent case on the subject is that of Bassett *vs.* Bradley, reported in the last (1880) volume of the Connecticut reports.

No special form of words is necessary to create a mortgage, if it be clear that the real property is held for payment of the obligation. Wherever the statute of frauds is in force, the mortgage must conform to its provisions. As to construction, parole evidence may be received to prove the existence of a condition, even though the deed seems on its face to be absolute. This, however, is allowed only when the parties have not reduced the whole of their negotiations to the form of a written contract; otherwise the usual rule as to written instruments applies. Though no special form of language must be used, yet the mortgage debt must be so described as to be intelligible to the examination of an interested party. If the obligation of the mortgage be to pay money it is almost always accompanied by a note or bond, but this is not necessary. If the obligation be to perform or not to perform a particular act, a bond should be given. If the note be lost, the loss must be set out in the pleadings, as it is the evidence of the debt which the mortgage is given to secure.

The rights and relations of the mortgageor and mortgagee are governed by the local laws of the states, the only universal rights being that of the mortgageor to pay before foreclosure, and of the mortgagee to hold the property for the debt. The provisions as to registration and foreclosure can be learned only by reference to the statutes of each state. Where the seizin is considered as in the mortgagee, he has the right to enter at any time, and, after entry, is regarded as a tenant in possession, and liable to the mortgageor for rents or profits received. No essential change in the property can be made by the mortgageor without the consent of his mortgagee. After foreclosure the mortgagee either takes the estate or the property is sold under statute regulations to satisfy the debt. He may bring an action for his debt in a court of common law if he choose, but must do so, if at all, within the time set by the statute of limitations. The usual method of foreclosure is by bringing a bill in equity setting out all the particulars of the mortgage contract and asking that a day be appointed before which the debt must be paid or the foreclosure proceed. Notice must be given to all parties interested. If there be several mortgagees, the court will appoint a day before which the mortgageor must redeem, a subsequent day before which the last mortgageor may assume the mortgage on which foreclosure is asked, and so on up to the mortgagee who brings the petition. If payment be not made, a certificate of foreclosure is issued and recorded. If the mortgage be an absolute one, the foreclosing party acquires full title to the property; but a strict foreclosure is unusual, the law generally providing that the land or other real property shall be sold at auction, and the claims paid in order of precedence, so far as the proceeds will allow. By common law, if the sum realized will not pay the amount of the debt, the mortgagee has no further remedy, but, by the laws of most of the states, the property is appraised, and judgment given by the court of equity for the excess, though sometimes the mortgagee is sent to a court of law for remedy. The mortgagee may refuse to accept payment before the day fixed. A tender of payment on the proper day met by refusal will usually release the mortgageor, but tender after that date is of no avail. The mortgagee may be compelled by law to give a release or quit claim deed after receiving payment, and it should always be required in order to make the record of title clear. Where the mortgagee has had the right of entry, and has applied rents or profits to the payment of the debt, the mortgageor may by a bill in equity be made to account therefor; he is also liable for waste, or any act tending to injure permanently the value of the property. This follows from the doctrine of equity that the seizin has not left the mortgageor. Assessments for public improvements in most states take precedence over mortgage liens. When a mortgaged property is sold it has been held in New York that the vendee does not become responsible for the mortgage debt beyond the value of the land, unless he specially assume the lien; but this is not the case in other states. Where the mortgage and debt are held to be one, they both pass on assignment of mortgage, but elsewhere they are severed. If the mortgage is paid in full by one of two or more mortgageors, the others are compelled to contribute, and equity considers him as an assignee of the whole mortgage.

MORTIER, **Edouard Adolphe Casimir Josephe**, Duc de Treviso; 1768—1835; first a soldier under the republic in 1790, adj.gen. in '93, in the battles of Mons, Bruxelles, Louvain, under gen. Kleber in 1794, repulsed the Austrians on the German frontier in 1796 and retook Mayence; gen. of division in 1799, charged by Napoleon with the conquest of Hanover in 1803, made marshal in 1804, head of an army corps in 1805, distinguished for skill in making resistance to an overwhelming force of Russians at Leoben the same year, in 1806 occupying Hanover and making the siege of Stralsund; in 1807 beat the Swedes at Anclam and Friedland; and at the peace of Tilsit June 21, was made governor of Silesia and duke of Treviso. In 1808 in Spain at the siege of Saragossa, and the battles of Ocana and Gebora; in 1809-11, with the French army in the Russian campaign, received the order to blow up the Kremlin, and after the battle of Krasnoe in Nov. 1812 commanded the rear-guard in retreat; arrived at Frankfort-on-the-Main late in 1812 and participated in the bloody battles of Bautzen, Dresden, and Leipsic early in 1813; fought in retreat with Napoleon in 1814, and when the latter was beaten, and at Elba, gave adhesion to the government of Louis XVIII. On the return of Napoleon from Elba joined him, and received command of the eastern department of France. After the hundred days he was reinstated in office by Louis, became member of the chamber of deputies in 1816, and of the chamber of lords in 1819. After the revolution of 1830 he was made ambassador at St. Petersburg, grand chancellor of the legion of honor in 1831, minister of war and president of the council under Louis Philippe in 1834-35, and died by a missile from the infernal machine of Fieschi while engaged in a public review by the king's side.

MORTIFICA'TION, in Scotch law, is a term used to denote lands given for charitable or public uses. When lands are so given, they are in general formally conveyed to the trustees of the charity, to be held blench, or in feu. When mortifications are given in general to the poor, without naming particular trustees, they fall under the administration of the Court of Session. By the statute 1633, c. 6, it was declared unlawful to alter any mortifications, and the managers were rendered liable to be called to account for malversation. Any person entitled to the benefit of the fund can pursue actions of this kind.

MORTIFICATION, in Medicine. See Inflammation.

MORTIMER, **Roger**, earl of March, 1287-1330, also baron of Wigmore; for some years a faithful adherent of Edward II. and his representative in Ireland, but in 1320 joined the insurgent barons who were hostile to the favorite, Despensers. In 1322 Mortimer was captured at Boroughbridge and imprisoned in the Tower of London, but escaped to France. There he met and fascinated queen Isabella, wife of Edward, became her paramour, and determined upon the overthrow of the king. With a small force he landed on the English coast and was soon joined by large numbers of the discontented nobles and common people. The king was defeated, taken prisoner and soon assassinated in his dungeon. Mortimer took the title of earl of March and was given confiscated estates of great value. Edward III. was but 14 yrs. old, and though a council held the regency, Mortimer's influence was supreme. He caused the death of Kent and Lancaster, both uncles of the young monarch. The latter resolved to be king in fact as as well as name, had the earl of March seized at Nottingham castle and summoned a new parliament. Mortimer was tried on charges of treason; condemned, and in 1330 hung, drawn and quartered near Smithfield.

MORTIS CAU'SA DEED, in Scotch law, is a deed which is made with a view to come into effect on the death of the maker. Since in Scotland land cannot be conveyed by will, as in England, it is necessary to execute an ordinary deed of conveyance, and to reserve the maker's life-rent, and to keep it in his own possession until his death, i. e., to suspend its effect during the life of the granter.

MORTISE AND TENON (Fr. *mortaise*, probably from Lat. *mordere*, to bite; *tenon*, from *tenir*, to hold), a form of joint in carpentry. The tenon is a projection, generally rectangular in form, on the end of a piece of wood, cut so as to fit exactly into a deep groove (called the mortise) cut in another piece, so that the two are united at a required angle. The framing of doors, shutters, and such pieces of joinery, is usually fitted together with mortise and tenon joints.

MORTMAIN, THE STATUTES OF (Fr. *mort*, dead, and *main*, hand). The object of the statutes of mortmain is to prevent priests and others from importuning a dying man to convey his land for charitable purposes. Hence, though a person can, up to the last hour of his life, if possessing sufficient knowledge of what he does, devise by will all his land to individuals absolutely, it is otherwise if he intend to give the land to trustees for a charitable purpose, as to build a church, or school, or hospital. The statute of mortmain, 9 Geo. II. c. 36 (1736), reciting that public mischief had greatly increased by many large and improvident dispositions made by languishing and dying persons to charitable uses, to take place after their deaths to the disinherison of their lawful heirs, enacted, that in future no lands or sums of money to be laid out in land should be given to any person or body, unless such gift or conveyance should be made or executed in presence of two witnesses twelve months before the death of the donor or granter, and be enrolled in the Court of Chancery within six months after the execution. Therefore, a person on death-bed cannot in England give land, or money to buy land, for a charitable purpose. It can only be done in the life of the donor, at least twelve months before his death; and the property must be completely alienated, so that he has no further control over it. The deed must have a present operation, and must not reserve any life-interest to the donor; it must be done at once and for ever. The policy of this statute has sometimes been questioned, and several well-known modes of evading the statute have been adopted from time to time. The act has been held to apply only to land locally situated in England; and hence, if the land is situated in Scotland, or the colonies, or abroad, a will conveying it for charitable purposes will receive effect. In Scotland, the mortmain act had no application; but it was not needed, as the common law of Scotland also put a similar check on the alienation of land on death-bed, which, however, has been abolished by statute. See DEATH-BED, INTESTACY.

MORTMAIN (*ante*), the alienation of real estate to a corporation. The term, however, is generally used of religious corporations. In consequence of the feudal restrictions on alienation, a corporation was obliged to get a mortmain license to make a valid purchase of lands. One of the chief objections to the alienation of land to religious corporations, was the loss to the lord of the fee, of the ordinary feudal profits, such as reliefs, wardships, and marriages, by the vesting of land in a technical person who cannot die or suffer attaint. The license of the sovereign was necessary, as the lord to whom, in the last resort, the fee would ultimately revert. If there were an intermediate lord between the alienating tenant and the king, his license must also be obtained for the alienation; for want of of such license, the land was forfeitable to the lord, after entrance. Licenses were necessary in Saxon times, and after the conquest, they are recognized in the constitutions of Clarendon. But the church continued to increase its lands, in spite of the restriction. The estate alienated without a license reverted, in the first instance, to the immediate lord of the fee. To escape this forfeiture, the tenant made a conveyance to the religious corporation, and then held the land as its tenant; the corporation thus obtained a sufficient seizin, to enable them to enter upon the land as immediate lord, under color of a surrender or forfeiture. By the 36th chapter of Magna Charta, such conveyances were made void. The prohibition in Magna Charta applied to religious houses only, so that religious corporations sole were exempt from its provisions; and the religious houses evaded it, by buying in lands that were really holden of themselves as lords of the fee, or by taking long terms for years. To meet these evasions, the statute, 7 Edw. I., *De Religiosis*, was passed.

The restrictive statutes applied to conveyances between the parties only, and the religious houses evaded them by bringing a suit to recover the land on a pretended title, in collusion with the tenant who would let the suit go by default. This kind of collusive suit came afterwards into general use under the name of a *common recovery*. The 2d statute of Westminster enacts a prohibition of this evasion, and the statute *Quia emptores*, permitting free alienation, expressly excepts alienation in mortmain. The next ecclesiastical device was to convey the land to feoffees to the use of the religious houses. The seizin thus remained in the feoffees, who were held by chancery to account for the rents and profits. This was the origin of uses and trusts. The statute 15 Richard II. declares all lands conveyed to the use of ecclesiastical persons, without the license of the king or intermediate lord, to be forfeited. The statute 23 Henry VIII. prohibited the conveyance of land for superstitious uses to non-corporate bodies also. Meanwhile it had always been possible for the crown to grant a mortmain license enabling a corporation to purchase and hold lands. At the time of the revolution, some doubts were felt in regard to the validity of such license, and by the statutes 7 and 8 William III. it was enacted that such license should henceforth be granted by the king, in his discretion. It is held that the before-mentioned statute of Henry VIII. applies to superstitious and not to charitable uses, so that a bequest to a hospital, for instance, was not voided by it. The mortmain acts have not been re-enacted in the United States except in a very few states; a corporation can hold land, but only a charitable corporation can take by devise. In some states the amount which can be bequeathed to charitable uses is limited by statute; within that limit the devise is good.

MORTON, a co. in the central part of Dakota, drained by the Missouri, which bounds it on the e., and by the Cannonball and Heart rivers. It is very scantily settled, the combined population of Morton, Mercer, Billings, and Stark counties being in '80, 1523. The surface is a rolling prairie with little wood. The Northern Pacific railroad passes through the center. Fort Abraham Lincoln and fort Rice are on the e. border.

MORTON, FOURTH EARL OF (JAMES DOUGLAS), regent of Scotland, was the second son of sir George Douglas of Pittendriech, and in 1553 succeeded, in right of his wife, Elizabeth, daughter of the third earl, to the title and estates of the earldom. He early favored the cause of the reformation, and in 1557 was one of the original lords of the congregation, Sworn a privy councilor in 1561, he was appointed lord high chancellor of Scotland Jan. 7, 1563. Having been one of the chief conspirators against Rizzio, the Italian secretary of queen Mary, on his assassination, Mar. 9, 1566, he fled with his associates to England, but, through the interest of the earl of Bothwell, soon obtained his pardon from the queen. Though privy to the design for the murder of Darnley, on the marriage of the queen to Bothwell, he joined the confederacy of the nobles against her. He was present at Carberry hill when Bothwell parted from the queen, and after Mary's imprisonment in the castle of Lochleven he was restored to the office of high chancellor, of which he had been deprived, and constituted lord high admiral of Scotland. On the death of the earl of Mar, in Oct., 1572, he was elected regent of the kingdom. His rapacity and avarice made him obnoxious to many of the nobles, and as the young king, James VI., desired to assume the reins of government, Morton resigned the regency in Mar., 1578. Subsequently obtaining possession of the castle of Stirling, with the person of the king, he recovered his authority, but was accused of participating in the murder of Darnley, and being tried and condemned, was beheaded at Edinburgh, June 2, 1581.

MORTON, CHARLES, 1626–95; b. England; educated at Oxford. He took orders in the English church, and was at first attached to the royalist party. He afterwards sided with the Puritans, and was obliged to give up his living in Cornwall on account of nonconformity. Soon after 1662 he opened a school at Newington Green, where Daniel Defoe was one of his scholars. To escape the persecution of the ecclesiastical courts he came to Massachusetts bay in 1686, accompanied by his pupil Penhallow, the future historian of the Indian wars. The same year, he became minister of the church in Charlestown, where he remained till his death. During a part of this time he was vice-president of Harvard college, and wrote a system of logic for use there.

MORTON, GEORGE, b. England, 1585; joined the Separatists, and settled, with his brother Thomas, at Leyden. He went over to London in 1620, where he became the agent of the Separatists. In 1623 he came to Plymouth, Mass., in the ship Ann, bringing emigrants and supplies to the pilgrims. Some years later he went back to England, where he died at a date unknown. He published in England, in 1622, a description of the Plymouth colony, under the title of *Mourt's Relation*.

MORTON, HENRY, PH.D., b. New York, 1836; educated at the university of Pennsylvania. He first studied law, but afterwards took up chemistry, and in 1863 became professor of chemistry in the Philadelphia dental college. In 1869 he conducted a number of parties sent out to take photographs of the solar eclipse of Aug. 7, and the same year he took the chair of chemistry in the university of Pennsylvania. In 1870 he became president of the Stevens institute of technology, at Hoboken, N. J. He has contributed many papers to scientific periodicals, such as the *Chemical News* and the *Philosophical Magazine*.

MORTON, James St. Clair, 1829-64, b. Philadelphia; graduated at West Point in 1851, and was appointed to the engineers. After serving as assistant professor of engineering at the academy, and taking charge of various works, he went to Central America at the head of the Chiriqui expedition in 1860. In the spring of 1862 he became chief engineer of the army of the Ohio, and in the following October was appointed to the same position in the army of the Cumberland, and soon afterwards he was made brig.gen. He built the intrenchments at Murfreesboro, and was engineer of the works at Chattanooga, in whose capture he took a prominent part. In 1864 he became chief engineer of the 9th army corps in Virginia, and served through the Richmond campaign, up to Petersburg, participating in the engagements at North Anna and Bethesda church. He was killed June 17, at the head of the union assault on Petersburg. He published a number of works on engineering and fortification.

MORTON, John, Cardinal, Archbishop, 1410-1500; b. England; educated at Cerne abbey and Oxford. Through his practice in the court of arches he attracted the attention of cardinal Bourchier, who presented him to Henry VI., who made him a member of the privy council. Edward IV. also took him into favor, made him master of the rolls in 1473, and in 1478 bishop of Ely, and lord chancellor. He was not in favor with Richard III., who arrested him, and committed him to the custody of the duke of Buckingham, from whom he escaped and fled to the earl of Richmond on the continent. He is said to have suggested the union of the houses of York and Lancaster, by the marriage of Richmond with the daughter of Edward IV. Henry VII., on his accession, made Morton a member of the privy council, and on the death of cardinal Bourchier he was promoted to the see of Canterbury. In 1487 he was again appointed lord chancellor, and in 1493 pope Alexander VI. made him a cardinal. The English life of Richard III. which bears the name of sir Thomas More has been attributed to Morton.

MORTON, John, 1724-77; b. Penn.; a surveyor by profession. In 1756 he was elected to the Pennsylvania legislature, in which he served for many years, part of the time as speaker. He was a delegate to the stamp act congress, convened at New York in 1765, and for the next four years was high sheriff for Chester co., the present Delaware county. Soon afterwards he became a justice of the court of common pleas, from which he was promoted to the state supreme court. In 1774 he was elected to the continental congress, where he gave the decisive vote of his state delegation for the declaration of independence, and acted as chairman of the committee of the whole on the proposals for confederation.

MORTON, Marcus, LL.D., 1784-1864; b. Mass ; educated at Brown university, and admitted to the Massachusetts bar. He obtained a good practice, and became an active democratic politician. He served in congress, 1817-21; was a member of the state executive council in 1823; and the next year was elected lieut.-governor. He sat on the bench of the state supreme court from 1825 to 1839, when he was elected governor of Massachusetts, beating Edward Everett, the whig candidate, by one vote. He had been an unsuccessful candidate for many years for this office, to which he was again chosen in 1842. He was collector of Boston during the administration of president Polk.

MORTON, Nathaniel, 1613-85; b. England; came with his father to America in 1623. On the death of his father he was taken into the family of gov. Bradford, whose wife was his maternal aunt, and early assisted the governor in public affairs. He was secretary of the colony in 1645, holding the office till his death. He had received a good education, and almost all the records of Plymouth colony during the 17th c., which were published in several large volumes by the government of Massachusetts, were in his handwriting. He published the *New England Memoriall; or a Brief Relation of the most Memorable and Remarkable Passages of the Providence of God manifested to the Planters of New England*, etc. It was compiled mainly from the manuscripts of his uncle, William Bradford, and the journals of Edward Winslow, and included the period 1620-46. In 1680 he wrote a history of the Plymouth church.

MORTON, Oliver Perry, 1823-77; b. Ind.; the family name, Throckmorton, was shortened by his father. He was educated at the Wayne co. (Ind.) seminary, and Miami university, Oxford, Ohio; studied law, and was admitted to practice at Centreville, Ind., in 1847. He rose to be a leading member of the Indiana bar, and in 1852 was elected a circuit judge. At an early age he interested himself in politics, at first as a democrat, but became a republican on the formation of that party. He ran for governor of Indiana in 1856 on the republican ticket; was defeated, and returned to the practice of law; but in 1860 was elected lieut.-governor of the state; the governor having been chosen U. S. senator, Morton became governor, Jan. 16, 1861. The beginning of the rebellion found the state legislature and the attorney-general of Indiana democratic, and thus a fierce and active opposition against furnishing aid for the prosecution of the war. Gov. Morton, who gained the sobriquet of "the great war governor," devoted himself, heart and soul, to plans for placing Indiana strongly on the side of the union, and even effected a sufficient loan on his personal responsibility to meet the exigencies of the situation: this obligation was afterwards assumed by the state. In 1864 he was elected governor by a large majority; but in the following year experienced a stroke of paralysis, and was obliged to go to Europe for his health. He was absent only a few months, and on his return resumed the duties of his office. In 1867 he was elected to the U. S. senate; and on the expiration of his term, in 1873, was re-elected for the term ending in 1879. In the senate he became the recognized leader of the republican party, while he accomplished a prodigious amount of labor, serving on the committees on foreign relations, agriculture, military affairs, private land claims, and privileges and elections. He was one of the principal promoters of the passage of the fifteenth amendment to the constitution, and sustained the administration in the effort to carry through the senate the proposed San Domingo treaty. For this last service he was offered the English mission, which he declined on the ground that his acceptance would involve the election of a democratic senator in his place by the legislature of Indiana. At the republican national convention in 1876, senator Morton received 124 votes on the first ballot for president. He was a member of the electoral commission called to decide the question of the disputed presidential election; and afterwards strongly pressed an amendment to the law directing the method of counting the votes. Senator Morton was a man of powerful intellect and determined will, and an orator of great popularity through his vigorous and straightfoward speech. During the latter part of his life his infirmities necessitated his use of assistance in moving about, and he had to be carried from the lobby of the senate chamber to his carriage. In his prime he was over 6 ft. in height, with a powerful physique.

MORTON, Perez, 1751–1837; b. Mass.; graduated at Harvard in 1771, and was admitted to the Boston bar. He pronounced the eulogy on gen. Joseph Warren, April 8, 1776. He was speaker of the state legislature, 1806–11, when he was elected state attorney-general, which office he filled with distinction till 1832. He married Sarah Wentworth Apthorp, formerly well-known as a writer of verses.

MORTON, Samuel George, m.d., American physician and ethnologist, son of an Irish emigrant, was b. in Philadelphia, Jan. 26, 1799. He studied medicine in Philadelphia, Edinburgh, and Paris, and in 1824 settled in Philadelphia, where he contributed papers on physiology and craniology to scientific journals. In 1834 he visited the West Indies, and made observations on the development of races. In 1839 he was appointed professor of anatomy in the Pennsylvania medical college, and published his great work, *Crania Americana*, based on his collection of 867 classified skulls. In 1844 he published *Crania Ægyptiaca*, based on the collection of George R. Gliddon, esq.; and in 1849 his last work, *An Illustrated System of Human Anatomy, Special, General, and Microscopic.* He died at Philadelphia, May 15, 1851. Morton may be regarded as the first American who endeavored to place the doctrine of the original diversity of mankind on a scientific basis. See the memoir of Morton prefixed to Nott and Gliddon's *Types of Mankind* (Philadelphia, 1854), a work largely illustrated by selections from his unedited papers.

MORTON, Sarah Wentworth Apthorp, 1759–1846; b. Mass.; married in 1781 to Perez Morton (q.v.). She acquired considerable reputation by her verses contributed to the *Massachusetts Magazine* over the signature of "Philenia." Under that pseudonym she published at Boston, in 1790, *Ouâbi, or the Virtues of Nature; an Indian Tale, in 4 cantos.* This work was followed in 1797 by *Beacon Hill,* a poem in 5 cantos; and in 1823 by *My Mind and its Thoughts,* a mixture of verse and prose pieces.

MORTON, Thomas, 1590–1646; b. England; a lawyer and member of Clifford's inn, London. He came to this country with Weston's colony in 1622. He soon returned to England, but came to Massachusetts bay with Wollaston in 1625, and took up his residence at Mount Wollaston, now a part of the town of Braintree. Morton called his settlement "Merry Mount," set up a may-pole there, and very much scandalized the Plymouth people by his merry-making. A small party came up from Plymouth in 1628, cut down the may-pole, took Morton to Plymouth, and sent him thence to England. Morton ventured to return in 1629, but was again sent home, and the next year his house at Wollaston was demolished. Morton, however, came once more to Massachusetts in 1643, and was imprisoned for a year by the authorities on account of his "scandalous book," *The New England Canaan,* which he had published in England in 1632. This work contains a valuable account of the condition of Massachusetts, mingled with amusing satire on the Puritans. The late J. L. Motley made Morton the subject of two novels, *Morton's Hope* and *Merry Mount.*

MORTON, William Thomas Green, 1819–1868, b. Mass.; commenced studying dentistry in Baltimore in 1840, continued there for 18 months and settled in Boston. He is, more than for anything else, known as the introducer and discoverer of the surgically useful anæsthetic properties of sulphuric ether. His attention was first called to the subject in 1844 when attending lectures at the medical college in Boston, and after some experiments performed upon himself, he administered the ether to a man Sept. 30, 1846, and extracted a firmly rooted tooth without pain. He repeated the operation, and making known the results to Dr. John C. Warren, he administered ether at the latter's request in the Massachusetts general hospital, Oct. 16, 1846, to a man for the operation of removing a tumor from the jaw. Dr. Morton obtained a patent for the use of ether, under the name of "letheon," in 1846, a month after the operation in the hospital, and a month after this, in England Dr. C. T. Jackson also claimed the honor of having made the discovery, and the Moynton prize of the French academy was equally awarded to Dr. Morton and to Dr. Jackson, but Dr. Morton declined to accept it, which resulted in his receiving in 1852 the large gold medal, the Moynton prize in medicine and surgery. He claimed compensation from congress for his invention, the government having used it, and also from individuals, and he was involved in many suits. He received, however, no compensation, and his life was spent in contests, literary, and legal, in regard to his invention. Memorials were presented to congress signed by many physicians, but for one reason or another they failed to secure what was asked. His latter years were spent upon a farm at Wellesley, Mass. where he d., from an affection brought on by reading an article which sought to deprive him of the merit of his discovery.

MOSA'IC, the art of producing artistic designs by setting small square pieces of stone or glass of different colors, so as to give the effect of painting. Both the origin of the art, and also of its name, are buried in obscurity; it was, however, much practiced by the ancient Romans, especially for ornamental pavements, specimens of which are almost always found whenever the remains of an old Roman villa are discovered. Under the Byzantine empire; it was also much used for the ornamentation of churches, in which it formed a large portion of the wall-decoration. It was re-introduced into Italy for the latter purpose about the middle of the 13th c. by Andrea Tafi, who learned it of some Greek artists employed at Venice in decorating St. Mark's. Since then it has been especially an Italian art, and to such wonderful perfection has it been brought, that most minute pictures are produced by it. Within quite recent years, mosaics of surpassing, beauty both in design and material, have been produced by Russian artists in the Imperial glass manufactory of Russia: those shown in the Russian department of the international exhibition (1862) have probably never been surpassed. The pieces of glass of every shade of color are technically called *smalts;* they are generally opaque, and are set in cement in the same manner as tiles or pavement. Some fine pieces of mosaic pavement have lately been produced in this country by Messrs. Minton & Co. of Stoke-upon-Trent, and by Messrs. Maw of Brosely, proving that the art only wants sufficient encouragement to obtain a high position. In Italy there are two very distinct varieties of mosaic work—i.e., the Florentine and the Roman; the former is entirely formed of pieces of stone or shell of the natural colors, and is limited in its application chiefly to floral and Arabesque designs. The later is made of the glass smalts mentioned above, and has so wide an application, that most of the finest paintings of the best old masters have been copied in mosaic, and the pictures so taken form the almost imperishable decorations of the finest churches of Italy. The manufacture of the opaque glass or smalts for making the little square pieces called tesseræ of which the pictures are composed, is a very important one, and is carried on in the Vatican, where 25,000 shades of the various kinds of colored glass are produced.

MOSAIC GOLD. See TIN.

MOSAIC WOOL, or WOOL MOSAIC, is a remarkable application of the principle of mosaic-work to the production of woolen or worsted rugs and carpets, having a definite design or pattern, independent of the ordinary processes of printing and weaving. Many attempts in this direction have been made, chiefly on the continent; but the most successful is that of Messrs. Crossley, in whose extensive carpet factory at Halifax the mosaic wool is produced as a regular department of manufacture.

In the first place, well-spun worsted threads are dyed to every color and almost every shade or tint, amounting to a hundred varities in all. An artist prepares a full-sized drawing of the pattern or design, ruled all over with cross-lines; this is copied on lined paper by girls, each of whom takes as much of the pattern as will fill a square foot. A workman (or woman) having a good eye for color, examines each square piece of drawing in detail, and selects the proper color of thread suitable to every portion of it; the threads are a little over 200 in. long each, or about 17 ft., and are numerous enough to pack closely together into a mass of one sq. ft. in width and depth. A strong iron framework, 17 ft. long, is so arranged that all these threads can be stretched on it horizontally, tied at one end, and weighted with 4 lbs. to each thread at the other. Girls, under the direction of the workwoman who selects the colors, arrange these threads one by one, tying them at one end, weighting them at the other, and supporting them on a steel bar in the middle. This being done, the mass of 17 ft. in length is cut up into blocks of 20 in. long each, for convenience in after-operations. All these processes are for one sq. ft. only of the pattern, and they have to be repeated as many times as there are sq. ft. in it. Supposing a rug 6 ft. by 2, with a lion, tiger, or other device occupying the greater part of the surface: there must be 12 masses prepared, and as each mass contains 50,000 threads, there will be 600,000 altogether. Blocks are cut from each mass, and are placed in an iron box or frame, side by side; thus forming a quadrangular solid 6 ft. by 2, and 20 in. deep, with the threads arranged *vertically*. Now, to convert this into a great number of separate rugs, the pattern of which is seen represented on the upper surface, formed by the ends of the colored threads, india-rubber is dissolved in camphine to the consistence of carpenter's glue, and brushed well over the top, so that every individual thread shall receive its portion; this being dried, a second coating is applied; and afterwards a third. A backing of canvas, or of some kind of strong cloth, is cemented down upon the mass of threads by a glue of the same kind, and is scraped and rubbed until it adheres to every individual fiber. When dry, the mass of threads is raised up three-sixteenths of an inch, by a screw acting upon a movable bottom to the box. A very keen circular cutter, 12 ft. in diameter, and rotating 170 times per minute, quickly severs a horizontal slice three-sixteenths of an inch thick, the box of threads being caused by an endless screw to travel onward to meet the cutter. This slice when turned up, presents the picture complete, in a beautifully soft nap, or pile of woolen threads, supported by a canvas or woolen backing. It is a mere question of hand-work to convert this into a rug, carpet, coverlet, or wrapper of any kind. A second repetition of the same processes converts another slice into a second rug; and so on, until the mass of 20 in. in depth has been cut up into about a hundred slices, each forming one rug. As the blocks of 20 in. were originally cut from a mass of 200 in., the whole mass produces about a thousand rugs, all exactly the same pattern. It is this power of repetition which makes the process pay; for the great preparatory labor of selecting and arranging (say) 600,000 distinct threads could not otherwise be compensated for.

MOSAYLIMA (Little Moslem), one of the most important rivals of Mohammed, belonged to the clan Dûl, a division of the tribe of the Bani Hanifah, of Yamâma in Nedjed. The traditions about his life and age are extremely contradictory and legendary. It appears, however, tolerably certain that he had risen to a certain eminence in his tribe, probably as a religious teacher only at first, before Mohammed assumed his prophetical office. The name he was known by among his friends was Rahmân, the Benignant or Merciful; a term which Mohammed adopted as a designation of God himself. This word, which is Aramaic, was a common divine epithet among the Jews, from whom Mohammed took it, together with a vast bulk of dogmas, and ceremonies, and legends. If, however, Mosaylima, as is supposed by some, assumed that name in the meaning of Messiah, Savior, it would prove that he had anticipated Mohammed in the apostleship, which is commonly denied. It was in the ninth year of the Hedjrah that Mosaylima, at the head of an embassy sent by his tribe, appeared before Mohammed, in order to settle certain points of dispute. The traditions are very contradictory on the circumstance whether or not Mosaylima was then already the recognized spiritual leader of his tribe. When they were introduced to Mohammed in the mosque, they greeted him with the orthodox salutation of Moslems—viz., "Salâm alayk" (Peace upon thee), and after a brief parley, recited the confession of faith. Shortly after this event, Mosaylima openly professed himself to be a prophet, as well as Mohammed. The latter sent a messenger to him, as soon as he heard of this, to request him to reiterate publicly his profession of Islam. Mosaylima's answer was a request that Mohammed should share his power with him. "From Mosaylima, the apostle of God," he wrote, according to Abdufeda, "to Mohammed, the apostle of God. Now let the earth be half mine, and half thine." Mohammed speedily replied: "From Mohammed, the apostle of God, to Mosaylima, the liar. The earth is God's: he giveth the same for inheritanee unto such of his servants as he pleases, and the happy issue shall attend those who fear him." Yet notwithstanding these testimonies, of probably late dates, it seems, on the other hand, perfectly certain that Mohammed made very great concessions to his rival—concessions that point to his having secretly nominated Mosaylima his successor, and that he by this means bought Mosaylima's open allegiance during his lifetime. It was not a question of dogmas, though they each had special revelations, but a question of supremacy, which was thus settled amicably. "Mohammed," Mosaylima said, "is appointed by God to settle the principal points of faith, and I to supplement them." He further had a revelation, in accordance with Mohammed's: "We have sent to every nation its own prophet," to the effect: "We have given unto thee [Mosaylima] a number of people; keep them to thyself, and advance. But be cautious, and desire not too much; and do not enter into rival fights."

When Mohammed was at the point of death, he desired to write his will. Whatever he may have wished to ordain, is uncertain; it is well known, at all events, that his friends did not obey his order, and refused to furnish him with writing materials, very probably because they did not like to be bound by his last injunctions. Sprenger supposes that he wished formally to appoint Mosaylima his successor, and that it was just this which his surrounding relations feared. Mosaylima then openly declared against Islam, and many parodies of the Koran sprang up in the Nedjed, ascribed to him. In the 11th year of the Hedjrah, it at last came to an open breach between the two rival powers. Abu Bekr, the caliph, sent Khalid, "the sword of the faith," with a number of choice troops, to compel Mosaylima to submission. Mosaylima awaited the enemy at Rowdah, a village in the Wadi Hanifah. So formidable indeed was Mosaylima's force, that Walid is said to have hesitated for a whole day and night before he undertook an assault unanimously disapproved of by his council. On the second morning, however, he advanced, and in a battle which lasted until the evening, contrived, with fearful losses of his own, to gain the victory. Mosaylima fell by the hands of a negro slave, and his head was cut off by the conqueror, and placed at the head of a spear, to convince both friends and foes of his death. Khalid then advanced to the slain prophet's birthplace, in order to slay all its inhabitants. They, however, by a clever stratagem contrived to conclude an honorable peace, but had to embrace Islam. The Mosleymian "heresy" was thus stamped out, and only a few scattered remnants of the new faith contrived to escape to Hasa and Basrah, where they may have laid the foundation of the later Karmathian creed.

It is extremely difficult to come to any clear notion of Mosaylima's real doctrines, as all the accounts that have survived of them come from victorious adversaries—adversaries who have not hesitated to invent the most scandalous stories about him. Thus, a love-adventure between Mosaylima and the prophetess Sajâh, the wife of a soothsayer of Yamâma, who is supposed to have stayed three days in his tent, is told with great minuteness, even to the obscene conversation that is supposed to have taken place between them during that time; the fact being that this story, which is still told with much relish by the natives, is without the slightest foundation. From the same source, we learn that Mosaylima tried to deceive his followers by conjuring-tricks. It seems, on the contrary, that Mosaylima was of much higher moral standing than Mohammed himself. Thus, he is said to have enjoined the highest chastity even among married people: unless there was hope of begetting children, there should be restriction of conjugal duty. Even the nickname, "Little Moslem," given to him seems to indicate that he, too, preached the unity of God, or Islam, as the fundamental doctrine of faith. How far his religion had a socialist tendency, and offered less show of dignity and outward morality to its followers, or whether it rejected fatalism, contained an idea of incarnation, and invested its preachers and teachers with a semi-mediatorial character, as the latest explorer of the Nedjed, Mr. Palgrave, tells us we have no means of judging. But we must receive these conclusions, probably drawn from the information of the natives, with all the greater caution, as that story of the prophetess Sajâh, whom he reports, after his informants, not only to have been properly married to Mosaylima, but to have, after his death, become a devout partisan of Islam, and to have entered an "orthodox alliance," does not, as we said before, deserve the slightest credence.

MOSCHELES, IGNAZ, 1794–1870, b. Prague; studied music under Dionysius Weber at the Prague conservatory, and at the age of 11 was the best pianist in Prague, and had begun to compose. In 1808, he went to Vienna, where he met Beethoven and Haydn, and took lessons from Albrechtsberger, who had been Beethoven's teacher. He soon won a reputation in concert, and disputed with Hummel the honor of being the first pianoforte player in Germany. After a tour of Germany, Holland, and France, he visited England, which was his residence till 1846. From 1825, he was professor in the London academy and conductor of the philharmonic concerts. The music of Beethoven was almost unknown in England at that time; and Moscheles, by his rendering of the sonatas and concertos of that composer, made the pianoforte a fashionable instrument. He was the most successful teacher, in his day, in England; but many later pianists, as most notably, Liszt and Thalberg, have surpassed him in execution. In 1846 he became professor at the conservatory at Leipsic. His own compositions are additions to classical music, and his compositions for other instruments than the piano show a profound theoretical knowledge. He published with notes, an English translation of Schindler's *Life of Beethoven*.

MOSCHI, a people of Asia living s. of the Caucasus. According to Pliny they dwelt around the sources of the Phasis, between the Euxine and Caspian seas. At the time of Augustus their territory is said to have been divided between Colchis, Armenia, and Iberia; and from them a mountain range extending from the Caucasus to the Anti-Taurus was called the Moschic mountains. Their name by early writers is often coupled with that of the Tibareni, and the two people are generally identified with the Meshech and Tubal of Scripture.

MOSCH'IDÆ, or (recently) MOSCH'INÆ. See MUSK DEER, *ante*.

MOS'CHUS, a bucolic poet who lived in Greece in the 3d c. B.C., and whose writings are classed with those of Bion who was his master. The two writers are published together in a translation in Bohn's *Classical Library*. He wrote in the Doric dialect, and all his works that have been preserved are fragmentary, idyllic, and pastoral in character, but much admired by scholars.

MOSCOW, an important government of Central Russia, lies s. of the governments of Tver and Vladimir. Area, 12,552 sq.m.; pop. '70, 1,772,624. The surface is level with the exception of a tract in the s.w., which is elevated. It is watered by the Moskva and the Kliazma, while the Oka forms a portion of its southern boundary. The soil, principally clayey, with some sandy and stony tracts, is on the whole, unfertile, and barely supplies local consumption. Few of the governments of Russia, however, equal that of Moscow in manufactures and general industry. In contains numerous cloth, silk, brocade, chintz, paper, and other factories. China-ware is manufactured from the clay dug up in the district of Gjelsk. Many of its villages carry on special branches of manufacture, of which pins, glass beads, and small looking-glasses for Asia is one. White limestone is quarried, and is much used for building in the capital; yellow marble quarries occur on the banks of the Oka. Peat is extensively used as fuel in the factories. Among the places historically celebrated are the monastery of St. Sergius, founded by one of the first Muscovite princes, and famous for its silver shrine, said to be the richest in the world; and the village of Borodino (q.v.).

MOSCOW (Russ. *Moskwá*), the ancient capital of Russia, and formerly the residence of the czars, is situated in a highly-cultivated and fertile district on the Moskva, 400 m. s.e. of St. Petersburg. with which it is in direct communication by railway. Lat 55° 40' n., long. 37° 33' east. Pop. '71, 601,979. Previously to its being burned in 1812, Moscow was perhaps the most irregularly built city in Europe, and that distinction to a great extent it still retains; for, as the main object in 1813 was to build speedily, the streets rose again on the old model, undulating and crooked, and consisting of alternating houses, the most varied in character and pretensions. Many improvements have, however, been recently accomplished in the city. Gas pipes have been laid along the streets; letter-boxes are placed at frequent intervals; the Romanzoff place, formerly so dirty, has been converted into a splendid square, with an ornamental garden, and the old obelisk, the former monument of the place, standing in the center, with water fountains on each side. The general view of the town, especially that obtained from an eminence on its southern side called the Sparrow hills, is eminently original and picturesque. Its hundreds of churches and convents, surmounted by gilt and variously-colored domes; its gardens and boulevards; and, above all, the high walls and crowded yet stately towers of the Kreml or citadel, produce a most striking effect. The Kreml, situated on the northern bank of the river, forms the center of the town, and around it, with a radius of about a mile, is a line of boulevards, extending, however, only on the n. side of the river. Outside of this line, and concentric with it, is another line of boulevards, with a radius of a mile and a half; while beyond all, and forming the girdle of the city, is the outer rampart, with a circumference of 26 English miles. The Kreml comprises the principal buildings, as the cathedral of the Assumption of the Virgin, founded in 1326, a small but gorgeously-decorated edifice; the cathedral of the archangel Michael, containing the tombs of all the czars down to the time of Peter the great. who changed the royal burial-place to St. Petersburg; the church of the Annunciation, the floor of which is paved with jaspers, agates, and carnelians of various shapes; the tower of Ivan Veliki 200 ft. in height, and surmounted by a magnificent gilded dome, from which, as from all the domes of Moscow, rises the "honorable cross;" the Czar Kolokol (king of bells), the greatest bell in the world; several palaces, and collections of ancient arms and other antiquities; the arsenal, surrounded by the splendid trophy of 850 cannons, taken from the French; and the senate. The walls of the Kreml are surmounted by 18 towers, and pierced with 5 gates. In the town, the chief buildings are the cathedral of St. Vassili, remarkable for its peculiar architecture; the Gostinoi Dvor, or bazaar; and the exchanges. The temple of the Savior, which was commenced in 1812, to perpetuate the memory of the repulse of the French invasion, is not yet completed; but when finished it will be a magnificent architectural feature of this ancient capital. The university of Moscow, the first in Russia, founded in 1753, is attended by 1800 students, and contains a library of 160,000 volumes, museums of natural history, and a botanical garden. As intermediate educational establishments between the parish schools and the university, there are provided 5 high schools or gymnasia for males, and 3 for females; special establishments are the technological. the agricultural. the oriental, 2 commercial, and 3 military schools. There are several learned societies in Moscow, which is also the seat of a metropolitan, one of the three highest dignitaries of the Russian church. The public museum and library, which was removed from St. Petersburg in 1861, occupies a large and handsome building, formerly a palace, is rich especially in ancient Slavonic MSS., and has about 200,000 volumes.

Moscow communicates by railway with St. Petersburg, Nijni-Novgorod, Koslov, etc. It is the seat of an extensive manufacturing and commercial industry; it imports largely, and carries on a considerable export trade, especially with Asia. Its trade is chiefly in hides, leather, oils, wool, grease, isinglass, wax, honey, feathers and down, potass, soap, iron, and copper; cotton from Asia, silks from Georgia, Persia, and Bokhara; Caucasian madder, home and Turkish tobacco, furs, tea, chemicals, and all the products of Russian manufacture, of which Moscow is the actual center. The chief manufactures are woolen and worsted goods, silks, brocades, dyeing, printing, tanning and skin-dressing, iron, copper, and silver works, and chandleries.

Moscow is of ancient origin for a Russian town. Its site was bought by Yuri Dolgoruki, in the 12th c., and a fortress built. In the 14th c. not only had it become the capital of the Russian religious world, owing to the residence there of the metropolitan, but it had also become the actual capital of Muscovy. In 1368, 1370, and 1372, it suffered from the inroads of the Lithuanians; in 1381 it was sacked by the Tartars. From 1415 to 1501 it was, on four separate occasions, partially destroyed by fires; and it was burned to the ground by Devlet-Girey, khan of the Crimean Tartars, in 1571. It was taken by the Poles in 1610, and remained in their possession till their expulsion by the Russians under Minin and Pojarsky in 1612. In 1682, 1689, and 1698, it was the theater of the revolts of the Strelitz. In 1812, from Sept. 14 till Oct. 24, it was in the hands of the French.

MOSCOW (*ante*). The present population of Moscow is about 700,000. Its growth within the past 30 years has been more rapid than at any former period, and it has become the center of the Russian system of railways. Though the newer parts have added boulevards, wide avenues, parks, and stately architecture to the attractions of the old city, it is the picturesqueness of the Kremlin, its aggregation of old and new palaces, its fortified walls and lofty towers, its churches, mosques, monasteries, domes, spires, and minarets, forming from a distance perhaps the most remarkable architectural scene in the world, that is still the greatest attraction of Moscow; and is even heightened in its effects by contrast with the old narrow and tortuous streets, their mingled poverty and magnificence, with the open, airy, and polished beauty of the new. Moscow is said to exceed in area any European capital except London and Constantinople. It is 466 m. s.e. of St. Petersburg, and 900 m. e. of the extreme westerly part of the empire.

MOSELEY, Henry, d.d., 1802–72; b. England; educated at Cambridge. He was for a number of years professor of natural philosphy and astronomy in King's college, London. He had already taken holy orders, and in 1853 was appointed canon of Bristol cathedral. He was afterwards presented to the living of Olveston, and made chaplain to the queen. He was a member of the school-board for many years. He published a number of scientific books, including a *Treatise on Mechanics Applied to the Arts*, and *Mechanical Principles of Engineering and Architecture.*

MOSELLE (Ger. *Mosel*), an affluent of the Rhine, rises in the Vosges mountains, France, at an elevation of 2,260 ft. above the level of the sea, not far from the sources of the Saône. Its course is north-westerly as far as Pont-à-Mousson, in the department of Meurthe, where it becomes navigable; then n. to Thionville, near the French frontier; after which it proceeds in a north-easterly direction (latterly, with many zigzag picturesque windings) through Luxemburg and Rhenish Prussia, joining the Rhine at Coblentz. On its way it passes the towns of Remiremont, Epinal, Toul, Pont-à-Mousson, Metz, Thionville, and Treves. From Metz to Treves it flows through a broad valley, inclosed by rounded vine-bearing hills. Its entire length is upwards of 330 miles. Its principal tributaries are the Meurthe, the Seille, and the Sarre on the right, and the Orne, the Sure, and the Kyll on the left. The wines grown in the basin of the Moselle are noted for their lightness and their delicate aromatic flavor. The inferior kinds are liable to acidity.

MOSELLE was formerly a frontier department in the n.e. of France, but the greater part of it was taken by Germany after the war of 1870–71. The small portion left to France was joined to the department of Meurthe. Population of Moselle in 1866, 452,157. It is watered by the Moselle and its tributaries; is richly wooded, and yields abundance of grain, fruits, and wine, though the last is of an inferior quality. Agriculture is in an advanced condition; roads are numerous, and the river navigation important. Coal, iron, and building-stone are the most valuable minerals. There are also linen, woolen, leather, glass, papier-mâché, and other manufactures.

MOSELLE WINES. See German Wines.

MOSENTHAL, Salomon Hermann, b. 1821, in the Prussian province of Hesse; a German dramatist, chiefly known by the dramas *Deborah* and *Sonnenwendhof*, which have been represented with success, and translated into English, Danish, Hungarian, and Italian.

MOSER, George Michael, 1705–83; b. Switzerland. At an early age he went to London, and became a gold-chaser. To this he at length added enamel painting, chiefly for lockets and watch cases, and won the notice and commendation of sir Joshua Reynolds. He was one of the founders and first keepers of the Royal academy, in which last capacity he was superintendent of the students in drawing from the antique.

MOSER, Johann Jakob, 1701–85; b. Germany; made professor extraordinary of law at the university of Tübingen in 1720. Six years later he became councilor at Stuttgart, and in 1727 he became ordinary professor of law at Tübingen. He resigned this chair on account of a quarrel with his colleagues, and for the same cause left the directorship of the university at Frankfort-on-the-Oder. He was engaged for many years in the preparation of his most important work, on the *Public Law of Germany*, and other legal books. He afterwards opened an academy in Hanover, where the sons of the nobility were taught public affairs.

MO'SES (Heb. *Mósheh;* LXX. and Vulg. *Moyses;* ? Egypt. *Mes* or *Messou;* Copt. *Mo-ushe*, i.e., drawn out of the water), prophet and legislator of the Israelites, born about 1600 B.C. in Egypt (? Heliopolis), during the period of their hard bondage. His father was Amram, his mother Jochebed, both of the tribe of Levi. The tale of his birth and early education has, by tradition (Manetho, Philo, Josephus, Midrash, etc.), received a much more extraordinary legendary character than is found in Exodus; while the main features are, on the whole, the same in them all. And there is no reason to doubt the truthfulness of an account which shows us Moses, like many other supreme benefactors and "suns" of mankind, struggling against an apparently adverse fate, nay for very life, from the instant of his birth. The well-known narrative, to which late traditions (contained in Philo, Josephus, the Fathers, etc.) have supplied questionable names and dates, is that Moses's mother, unable to hide the child—which was to have been drowned at its birth—longer than for the space of three months, put it into a basket of papyrus, and hid it among the Nile rushes, Miriam, his sister, watching it from afar. The king's daughter (Thermuthis, or Merris?), coming down to the river, observed the weeping child, and was so struck with its beauty that she allowed Miriam to fetch a Hebrew nurse, Jochebed. Grown up, he was sent to the king's palace (Heliopolis) as the adopted son of the princess, and here seems to have enjoyed not only princely rank, but also a princely education. He is also said to have become a priest, under the name of Osarsiph or Tisithen, and to have been a mighty adept in all the sciences of "Egypt, Assyria, and Chaldea;" to have led Egyptian armies against the Ethiopians, defeated them, and pursued them to their stronghold, Saba (Meroe); this place being delivered into his hands by Tharbis, the king's daughter, whom he subsequently married. The Bible contains nothing whatever about the time of his youth. He first reappears there as the avenger of a Hebrew slave, ill-treated by an Egyptian overseer. Threatened by the discovery of this bloody act, he escapes into Midian, where he is hospitably received by Jethro, the priest, and married his daughter, Zipporah. He stayed for many years in Midian, tending the flocks of his father-in-law. This most sudden transition from the brilliant and refined life of an Egyptian court, of which he had been brought up a prince, to the state of a poor, proscribed, exiled shepherd, together with the influences of the vast desert around him, must in Moses's mind have produced a singular revolution. The two names which he gave to his sons, strikingly express part of what filled his soul—a feeling of gratitude for his salvation from the avenging hand of justice, and the deep woe of his exile. The fate of his brethren went now to his heart with greater force than when he was a prince and near them. There rushed upon his memory the ancient traditions of his family, the promises of Jehovah to the mighty sheikhs, his forefathers, that they should become a great and a free nation, and possess the ancient heritage of Canaan; why should not he be the instrument to carry out this promise? The *Ehye asher Ehye* (I am that I am) appeared to him while his mind was occupied with such thoughts, and himself put the office upon his shoulders. A new king had succeeded in Egypt, his old enemies were either dead or had forgotten him, and Moses returned to Egypt. Together with Aaron, his brother, the man of small energy but of fine tongue, he consulted about the first steps to be taken with the king as well as with their own people—both of whom treated them at first with suspicion, nay, with contempt.

After ten distinct plagues (more or less akin to natural phenomena peculiar to Egypt), the last being the death of all the firstborn, Pharaoh consented to let his slaves go free, "that they might serve their God." Moses very soon had occasion to prove that he was not only the God-inspired liberator of his people, who in the enthusiasm of the moment had braved the great king and his disciplined armies, but that he possessed all those rarer qualities which alone could enable a man to mold half-brutalized hordes of slaves into a great nation. Calmness, disinterestedness, patience, perseverance, meekness, coupled with keen energy, rapidity of action, unfailing courage—"wisdom in council and boldness in war"—constituted the immense power which he held over the hundreds of thousands who knew no law in their newly-acquired liberty, and who were apt to murmur and to rebel on any or no provocation. Nor were the hostile Bedouin tribes, whose territories the new emigrants approached, easily overcome with untrained warriors, such as formed the ranks of Moses's army. The jealousy of certain elders fostering seditions within, added to his unceasing vexations; and to fill the measure to overflowing, indeed, his own brother Aaron, whom he had made his representative during his temporary absence on the Mount of Sinai, himself assisted in the fabrication of an idol. His sacred office as legislator he in reality first assumed in the third month after the Exodus, when, after many hard and trying marches and counter-marches—from Goshen to Succoth (? Latopolis, the present old Cairo); thence, by a *detour*, to Etham (? Ramlieh), Pi-hachiroth (? Bedea), through the Red sea, to the desert of Shur (? Al-Djofar), Marah, Elim (Wadi Gharandel), desert of Sin (Wadi Mocatteb, or Wadi Al-Sheikh), Dophka, Alus, Raphidim (near the Makkad Sidna Mousa)—made more trying by want of food and of water, by encounters with Pharaoh and the Amalekites, having arrived near the Mount of Sinai, he made the people encamp all round, and ascended the summit of the mountain by himself. On the incidents connected with the "revelation" made to the whole people, we need not dwell any more than on any other part of this well-known narrative. Suffice it to point out briefly, that the tendency of the whole law was to make the Hebrews a people "consecrated to the Lord," "a holy people, and a kingdom of priests," i.e., a people of equals both before God and the law. Three distinct parts compose this Mosaic constitution. The doctrine with respect to God and his attributes; the "symbolical" law, as the outward token of his doctrine, and the moral and social law. The Decalogue forms a kind of summary of all the three: the existence of Jehovah as the Absolute Being, the liberation of the people and the prohibition of polytheism, and the representation of the divinity by visible images (i.—iii). While the institution of the Sabbath, the symbol of creation and the Creator, forms the basis of all religious observances (iv.), the remaining part of the laws relate to the intercourse among the members of the human commonwealth; the gratitude of children is inculcated; murder, adultery, theft, false witness, coveting of others' goods are prohibited. The groundwork of these regulations had, indeed, been a special inheritance in the family of the Abrahamites from the earliest times; but the vicissitudes of fortune, the various migrations, and the enormous increase of this family, and its being mixed up for long years with the surrounding idolaters, had obliterated nearly all traces of the primeval purity of creed in the populace. The wisdom displayed even in the minor regulations of the Mosaic dispensation, with respect to their adaptation to the peculiarity of the race, the climate, the political state of the country which they were to inhabit; in the hygienic regulations, and the rules which treat of the social and domestic relations; and, above all, the constantly-reiterated caution from mixing again with other nations, such as they found them in Canaan—and the neglect of which subsequently proved their ruin—is traced to a direct influence of Jehovah, generally indicated by the words, "And God spake to Moses, speak unto the children of Israel." An ample ritual, in connection with the tabernacle, or constantly-visible symbol of a divine dwelling; the allegory of an ever-new covenant represented by sacrifices, prayers, purifications, kept the supreme task of being priests and a holy people unceasingly before the eyes of the nation. The tribe of Levi (q.v.) to a certain degree acted in this respect as permanent representatives; and not to Moses's sons, but to his brother Aaron and his descendants, was intrusted the office of high-priest.

When on the eve of entering into the promised land, the people broke out in open rebellion, and threatened, by a spontaneous return to the land of slavery, to undo the entire work of Moses's life. Convinced that they were not as yet fit to form a commonwealth of their own, the liberator and lawgiver had to postpone, for the long space of 40 years, the crowning act of his work; and, in fact, did not himself live to see them taking possession of the hallowed territory. How these years of nomadic journeying through the desert (El-Tyh or Al-Tyh Beni-Israel) were spent, save in rearing up a new generation of a more manly and brave, as well as more "civilized" stamp, we can only conjecture. All those who had left Egypt as men were doomed to die in the desert, either by a natural death, or by being suddenly "cut off," in consequence of their openly defying Moses, and through Moses Jehovah. The apparent lack of incidents during this period has indeed furnished grounds for various speculations on this subject, and critics have tried to reduce it to a much shorter space, without, however, being able to prove their point. Even Goethe, with more ingenuity than knowledge of the subject, has endeavored to prove the "forty" to be a mythical round number, the real time being two years. The testimonies of the Hebrew prophets and historians, however, are perfectly unanimous on the subject (cf. Jos. v. 6; xiv. 10; Amos, ii. 10; v. 26; Ps. xcv. 10, etc.) and modern criticism has mostly endorsed the number as in keeping with the circumstances. On the first month of the fortieth year after the exodus, we find Moses at the head of an entirely new generation of Hebrews at Kadesh, in the desert of Phoran or Zin. Here his sister Miriam died. Here also, for the first time, Moses seeing the new generation as stubborn and "hard-necked" as their fathers, is recorded to have despaired of the Divine Providence; and his disobedience to the letter of the command given to him, "to speak to the rock," is alleged as the reason "that his bones too had to fall in the desert." His brother Aaron died at Hor (near Petra, according to Josephus and St. Jerome), whither the Israelites had gone next. Not long afterwards, Moses once more had occasion to punish with relentless severity the idolatrous tendencies of the people (Baal Peor), thus showing that age had had no power of making him relax his strong rule over the still half-savage and sensuous multitude. Having finally fixed the limits of the land to be conquered, and given the most explicit orders to Joshua, to Eliezer, and the chiefs of the ten tribes, respecting its division, he prepared the people for his own impending death. He recalled to their minds in the most impressive language, their miraculous liberation, and no less miraculous preservation in the desert. Their happiness—their life—was bound up, he told them, in the divine law, communicated through him by Jehovah. A recapitulation of its principal ordinances, with their several modifications and additions, and reiterated exhortations to piety and virtue, form the contents of his last speeches, which close with one of the grandest poetical hymns. The law was then handed over to the priests that they might instruct the people in it henceforth; Joshua was installed as successor (while his own sons sunk into the obscurity of ordinary Levites), and he blessed the whole people. He then ascended the mount of Nebo, from whence he cast a first and last look upon the land for which he had pined all his life, and on which his feet were never to tread. He died upon this mountain, 120 years old, in the full vigor of manhood, according to the Scriptures, "and no man knew his burial-place up to this day"—so that neither his remains nor his tomb were desecrated by "Divine honors" being superstitiously paid to them.

This is a summary of Moses's life as derived from biblical as well as non-biblical sources. The latter—except, perhaps the very doubtful traditions of Manetho—belong, whatever may be the date of the respective documents of the Pentateuch, to a much later age, and bear the air of tradition and legend, grown out of those very documents, so plainly on their face, that they are of about the same importance for historical purposes as the cycle of Midrash-sagas that have gathered around Moses, and which are reproduced variously in Moslem legendaries. On his office as a "prophet:"—what was the special nature of his revelations, how far the doctrines promulgated by him were traditional among the Abrahamites, and how much of his laws is due to Egyptian influences; whether part of them was first inaugurated by later generations and ascribed to him, or whether others were never carried out at all: on these and similar questions which have been abundantly raised, more especially in recent times, we must refer for fuller information to the special works on the subject. Some notices of the more important points will be found under GENESIS, JEWS, PENTATEUCH, DECALOGUE, etc. There seems, however, but one conclusion. The brief span of human history of which we have any knowledge, shows few, if any, men of Moses's towering grandeur—even with all the deductions that the most daring criticism has yet proposed.

MOSHEIM, JOHANN LORENZ VON, a distinguished church historian of Germany, was b. at Lübeck on Oct. 9, 1694, and studied at Kiel. In 1723, he became ordinary professor of theology at Helmstedt, from which he was removed in 1747 to a similar office in Göttingen. He died chancellor of the university of Göttingen, Sept. 9, 1755. His theological works are numerous, amongst which are a work on Bible morality, *Sittenlehre der Heiligen Schrift* (new ed. continued by J. P. Miller, 9 vols. Helmst. 1770–78); and discourses, *Heiligen Reden* (3 vols. Hamb. 1732, et seq.). But his most important contributions to theological literature are in the department of ecclesiastical history, in which his *Institutiones Historiæ Ecclesiasticæ* (Helmst. 1755) is familiar to every student as a work of great learning, fullness, and accuracy. It has been translated from the original very elegant Latin into English and other languages. The best English translation is that by Dr. James Murdock (3 vols. New York, 1832), of which there are many reprints. Besides this, Mosheim is the author of *Institutiones Historiæ Christianæ Majores* (Helmst. 1763); *De Rebus Christianorum ante Constantinum Commentarii* (Helmst. 1753): *Dissertationes ad Hist. Ecclesiasticam pertinentes* (2 vols. new ed. Altona, 1767); and *Versuch einer unparteiischen Ketzergeschichte* (2 vols. Helmst. 1746–48). His stand-point is that of liberal orthodoxy: yet he is essentially *dogmatic*, and pays more regard to the mere "opinions" of men than to the character and genius shining through them; hence, his *Church History* is far inferior in point of richness, depth, and suggestiveness to that of Neander.

MOSKWA, a river of European Russia, a branch of the Oka, which is itself a branch of the Volga. It is celebrated in history for the great battle, called the battle of Borodino (q.v.), fought on its banks, Sept. 7, 1812, from which Ney (q.v.) obtained his title Prince of Moskwa. The Moskwa rises in a marsh in the government of Smolensk, passes close by the towns of Moshaisk and Svenigrod, passes through the city of Moscow, and joins the Oka near Kolomna, in the government of Moscow. The whole length of its course is about 290 miles. A considerable commerce is carried on by boats on the Moskwa, and it is directly connected with the Volga by the *Moskwa Canal*.

MOSLEM. See MUSSULMAN; MOHAMMEDANISM; *ante*.

MOSOSAU'RUS, MEUSE LIZARD, a genus of huge marine lizards, whose remains occur in rocks of cretaceous age. Three species are known, one from the upper chalk of Sussex, a second from the cretaceous beds of North America, and the third from the Maestricht beds. This last (*M. Hofmanii*) was first known from a nearly perfect head dug out of St. Peter's Mount in 1780, and popularly called the great animal of Maestricht. Originally the property of Hofman, it was taken from him, in virtue of some clause in their charter, by the ecclesiastical authorities of Maestricht. who, in their turn, were compelled to give it up to the victorious French army, and by them it was removed to Paris. It is said that the French cannoniers, when preparing for the siege, had instructions not to point the artillery toward that part of the town in which the precious specimen was deposited. This head is 4 ft. in length, and the animal to which it belonged is estimated to have been 25 ft. long. The total number of the vertebræ was 133: they were concave in front and convex behind, and were fitted to each other by a ball-and-socket joint, admitting of easy and universal flexion; the sacrum seems to have been wanting. The limbs were developed into four large paddles, and these with the comparatively short and strong tail, the bones of which were constructed to give great muscular power, enabled the animal to move quickly through the water in pursuit of its prey. The jaws were furnished with a single row of strong conical teeth. Cuvier first showed the affinities of the animal. It is most nearly related to the modern monitor, but differs from all modern lizards in its peculiar adaptations for an ocean life, and in its great size. The largest living lacertian is only 5 ft. in length, and of this a large proportion is made up by the tail; the Mososaurus, with its short tail, is estimated to have been at least 25 ft. long.

MOSQUE, a Mohammedan house of prayer. The word is derived, through the Italian *moschea*, from the Arabic *mesjid*, a place of prayer. The form of the oldest mosques (at Jerusalem and Cairo) is evidently derived from that of the Christian basilica, the narthex being the origin of the court, with its arcade, and the eastern apses representing the principal buildings of the mosque facing Mecca. The original forms became, however, entirely obliterated in the progress of Mohammedan architecture, and the mosques, with their arcaded courts, gateways, domes, and minarets, became the most characteristic edifices of Saracenic art. Wherever the Mohammedan faith prevailed, from Spain to India, beautiful examples of these buildings exist. They vary considerably in style in different countries, the Saracens generally borrowing much from the architecture of the various nations who adopted their faith. In India, the mosques have many features in common with the temples of the Jains, while in Turkey they resemble the Byzantine architecture of Constantinople. Everywhere the dome is one of the leading and most beautiful features of the mosques, which commonly consist of porticoes surrounding an open square, in the center of which is a tank or fountain for ablution. Arabesques and sentences of the Koran inscribed upon the walls, which are generally white-washed, and never bear any device representing a living thing, are the only ornaments of the interior. The floor is generally covered with mats or carpets: there are no seats. In the s.e is a kind of pulpit (Mimbar) for the imám; and in the direction in which Mecca lies (the Kibleh), there is a niche (Mehrab) toward which the faithful are required to look when they pray. Opposite the pulpit, there is generally a platform (Dikkeh), surrounded by a parapet, with a desk bearing the Koran, from which portions are read to the congregation. The five daily prayers (see MOHAMMEDANISM), which are generally said at home—especially by the better classes—on week-days, are said in the mosque by the whole congregation on Fridays, the days of Al-Gumah, or the assembly, the Moslem Sundays, together with some additional prayers, and at times a sermon is superadded to the service. It is not customary for women to visit the mosques, and if they do, they are separated from the male worshipers. The utmost solemnity and decorum are preserved during the service, although in the hours of the afternoon (when there is no worship) people are seen lounging, chatting, even engaged in their trade, in the interior of the sacred building. On entering the mosque, the Moslem takes off his shoes, carries them in his left hand, sole to sole, and putting his right foot first over the threshold, he then performs the necessary ablutions, and finishes by putting his shoes and any arms he may have with him upon the matting before him. The congregation generally arrange themselves in rows parallel to that side of the mosque in which is the niche, and facing that side. The chief officer of a mosque is the nazir, under whom are two imáms, a kind of religious official, in no way to be compared with what we understand by a clergymen of a creed, but who performs a certain number of religious rites, as long as the nazir allows him to do so, and who, being very badly remunerated, generally has to find some other occupation besides. There are further many persons attached to a mosque in a lower capacity, as mueddins (q.v.), bowwabs (door-keepers), etc., all of whom are paid, not by the contributions levied upon the people, but from the funds of the mosque itself. The revenues of mosques are derived from lands. With many of the larger mosques, there are schools, academies (medressehs), and hospitals connected, and public kitchens, in which food is prepared for the poor.

MOSQUÉRA, RUY GARCIA, 1501–55, b. Spain, a navigator who accompanied Sebastian Cabot to South America in 1526, where nine years later he joined Pedro de Mendoza in founding Buenos Ayres. His descendants for three hundred years have been prominent and influential in Colombia.

MOSQUI'TO (Span. *gnat*), a name very generally given to the most troublesome species of *culex*, and allied genera. See GNAT. The name mosquito is given, according to Humboldt, in some parts of tropical South America to species of *simulia*, which are active during the day, whilst species of *culex*, active chiefly during the night, are called *zancudoes;* but these latter are the mosquitoes of other countries generally. The name was probably first used in the West Indies, where it particularly designates a species (*C. mosquito*) very similar to the common gnat, but not quite so large, with black proboscis, and marked with silvery white on the head, thorax, and abdomen. It abounds in the warm parts of America, especially in marshy districts and in the vicinity of stagnant waters. It and similar species extend even to very northern regions, appearing during the heat of summer in prodigious swarms. Similar species are found also in similar situations in almost all parts of the world, and are almost as great a pest in Lapland as within the tropics. The bite which they inflict is painful, and their incessant sharp buzzing prevents sleep. In India and other countries, beds are provided with *mosquito curtains* of gauze, which are closely drawn, to protect the occupant, while the natives who cannot avail themselves of such protection, smear their bodies with oil. So numerous are mosquitoes in some localties in South America, that the wretched inhabitants sleep with their bodies covered over with sand three and four inches deep, the head only being left out, which they cover with a handkerchief; and travelers have been obliged to have recourse to the same expedient. Even thick clothes afford at best a very partial protection from mosquitoes, being readily penetrated by the proboscis. Mosquitoes are readily attracted to a lamp, and perish in its flame; but where they are numerous, a lamp only causes additional swarms to congregate to its neighborhood until it is extinguished, as is often very soon the case, by their dead bodies.

MOSQUITO COAST, MOSQUITO TERRITORY, or MOSQUITIA, formerly a native kingdom, under the protectorate of Britain, lies on the e. coast of Central America, having Honduras on the n., Nicaragua on the w., and Costa Rica on the south. The area is estimated at 15,000 English sq.m., but as 20,000 m. of contested territory lie between it, and Honduras and Nicaragua, its extent would be more correctly given at 25,000 sq. miles. The coast is low, with many bays and lagunes, and possesses a number of good harbors. The two principal rivers are the Rio de Segovia (which rises within 35 m. of the Pacific ocean), and the Rio Escondido, both of which flow into the Caribbean sea. The climate is rainy, and the temperature, considering the latitude, is cool and equal, the thermometer seldom rising above 82° or falling below 71°. On the whole, this territory is one of the most healthy parts of Central America. Ague is not unusually common, epidemics are exceedingly rare, and white people who do not recklessly expose themselves enjoy the best health. The swampy grounds are generally covered with dense forests, in which dye-woods and timber-trees of great value abound. Rice, maize, manioc, and other tropical plants, are cultivated. The country abounds in deer of various kinds, half-wild horses and oxen roam in the savannas, which are covered with tall grass, and alligators and serpents are common. The chief exports are mahogany, cocoa, ginger, sarsaparilla, and tortoise-shell, but the whole trade is inconsiderable. The inhabitants are of various races, the greater portion being aboriginal, but many are a cross between the native Indians and runaway negroes; they do not number more than from 10,000 to 15,000 in all. Their chief occupations are hunting and fishing, but a little agriculture and cattle breeding are also practiced.

The Mosquito Coast was discovered in 1502 by Columbus, and though never conquered, was claimed by Spain till about 1660, when the king, with consent of his people, placed himself under the protection of Britain. British colonists at different times attempted to found settlements in various parts of the country, but from various causes were soon after compelled to withdraw. Of late years they have met with more success. The foothold Britain thus obtained in Central America was viewed with great jealousy by the United States, who left no means untried to effect her expulsion. During the British protectorate a sort of constitutional government was established, consisting of a legislative body, and regular jury courts. In July, 1850, the United States and Great Britain bound themselves by the Clayton-Bulwer treaty "not to occupy, fortify, colonize, or exercise dominion over the Mosquito Coast, or any part of Central America;" and in November, 1859, Britain ceded the protectorate of Mosquito Coast along with the Bay islands to Honduras, a proceeding which gave rise to much discontent among the natives of the coast, and a complete rebellion of the islanders. However, by a subsequent treaty, concluded Jan. 26, 1860, the whole territory was finally handed over to Nicaragua.

MOSS-AGATE. See MOCHA STONE, *ante*.

MOSS-BUNKER, or BONY FISH. See MENHADEN, *ante*.

MOSSES, *Musci*, an order of acotyledonous plants, consisting of mere cellular tissue without vessels, and distinguished from *Hepaticæ* (q.v.), the order with which they are most nearly allied, by having always a leafy stem, and an operculated capsule or urn (*sporangium* or *theca*), which opens at the top, and is filled with spores arranged around a central column (*columella*). The capsule is covered by a hood (*calyptra*); and when it is ripe, and has thrown off the calyptra and operculum, exhibits around its mouth a single or double row of rigid processes, few or numerous, but always either four or a multiple of four, collectively called the *peristome*. These reproductive organs are viewed by many botanists as female flowers or *pistillidia*; whilst reproductive organs of another kind, sometimes found on the same plant, but more generally on distinct plants, are regarded as male flowers or *antheridia*, These are minute cylindrical sacs, occurring in the axils of the leaves, or collected into a head inclosed by variously modified leaves at the summit of the stem, and finally bursting and discharging a great number of spherical or oval vesicles, through the transparent walls of which, when moistened with water, filaments (*spermatozoïds*) coiled up within them may be seen wheeling rapidly round and round. As the sacs merely discharge these vesicles and perish, it is supposed that the spermatozoids contained in them may effect the fertilization of the spore-producing capsules; but this wants confirmation, and their particular office as reproductive organs is not yet fully ascertained.—None of the mosses are large plants, many are very small. Many have elongated stems, often branching; others have the stem scarcely developed, so that they seem to consist of a mere tuft of leaves. They are generally social in their manner of growth. They are among the first plants which begin to clothe the surface of rocks, sands, trunks of trees, etc., adapting inorganic matter for the support of higher kinds of vegetation. They love moisture, and are generally more abundant in cold and temperate than in hot climates. They struggle for existence on the utmost limits of vegetation in the polar regions and on mountain-tops. They dry up and appear as dead in a very dry state of the atmosphere, but revive when moisture returns. Some of them grow in bogs, which they gradually fill up and consolidate. They are of great use in protecting the roots of many plants from cold and from drought, and afford harbor to multitudes of insects. Some of them supply food for cattle, particularly for the reindeer, when nothing better is to be obtained, and a wretched kind of bread is even made by some of the dwellers in the Arctic regions, of species of *Sphagnum*. Some are astringent and diuretic, but their medicinal virtues are unimportant. Among the other principal uses to which they are applied by man are the packing of things liable to be broken, the littering of cattle, the covering of garden plants in winter, and the stuffing of the open space in roofs to moderate the heat of attic rooms in summer and their cold in winter—perhaps the most important use to which they are ever put, at least in Britain, and to which, as the benefit is great and easily attained, it is wonderful that they are not much more frequently applied. The abundance of mosses in meadows and pastures is disagreeable to farmers. The best remedies are proper drainage, the application of lime, and the liberal use of other manures, by which the soil may be enriched, so that better plants may grow with sufficient luxuriance, upon which the mosses are choked and disappear.

Several thousand species of mosses are known. Many of the mosses are very beautiful, and their capsules and other organs are interesting objects of study, even with an ordinary magnifying-glass.

MOSS-TROOPERS, marauding bands that inhabited the borders between Scotland and England during the last half of the 17 c., compelling the vicinage to purchase security by paying a constant rent to them. They were called moss-troopers because they dwelt in the mosses and always rode in troops. In Fuller's *Worthies of England* it is stated that, at one time, they numbered several thousands, and that their great enemies were "the laws of the land and the lord William Naworth," who finally reduced them to legal obedience. Scott mentions them in *The Lay of the Last Minstrel*.

MOSTAR', a t. of European Turkey, capital of Herzegovina (q.v.), on the Narenta, forty-five miles s.w. of Bosna-Serai. It is surrounded by embattled walls, contains ten mosques, a Greek church, and a famous Roman bridge of one arch, ninety-five ft. in span. Silk, grapes, and wine are produced, and knife-blades and weapons are manufactured. Mostar is also a place of considerable trade. Pop. 18,000.

MO'SUL, a t. of Asiatic Turkey, in the province of Al-Jezireh (ancient Mesopotamia), is situated on the right bank of the Tigris, opposite the ruins of ancient Nineveh (q. v.), and 180 m. up the river from Bagdad. It is surrounded by walls, and is still in a more flourishing condition than most Turkish towns, on account of its caravan trade with Diarbekir, Bagdad, and Aleppo, though its prosperity is nothing to what it formerly was. During the middle ages it supplied all Europe with its rich manufactures—*muslins*, according to Marco Polo, got their name from this town, now, on the contrary, the bazaars of Mosul, are filled with the manufactures of the west. The principal causes of its diminished importance are the rise of Abushehr (q. v.) as an emporium of trade, and the opening up of the new sea-route to India by the isthmus of Suez. Mosul is the seat of a Jacobite patriarch, and was formerly the great metropolis of all the Mesopotamian Christians (the Nestorians, the United Chaldæans, the Jacobites, etc.), but war, pestilence, famine, Mohammedan proselytism, oppression, and incessant anarchy have greatly reduced their numbers. Pop. estimated at from 18,000 to 40,000, of whom about a fourth are Christians; 1500 Jews; the rest Mohammedans (Arabs, Kurds, and Turks).

MOTACIL'LIDÆ. See WAGTAIL.

MOTAZ'ILITES, or MUTAZALITES, a "heretical" Mohammedan sect, dating a few generations after Mohammed, of which brief mention has been made under the heading MOHAMMEDAN SECTS. Their name is derived from an Arabic word, denoting to "separate one's self," and originally applied to any special sect or union of men, but the Motazilites becoming the most important and dangerous in Islam, they received this denomination by way of eminence. They were also called Moattalites—i. e., those who divest God of his attributes—and Kadarija, i. e., "those who hold that man has a free will, and deny the strict doctrine of predestination." The first beginnings of this sect are traced to Mabad, who, in the time of Mohammed himself, already began to question predestination, by pointing out how kings carry on unjust wars, kill men, and steal their goods, and all the while pretend to be merely executing God's decrees. The real founder of the sect, as such, however, is Wasil, b. Ata. He denied God's "qualities," such as knowledge, power, will, life, as leading to, if not directly implying, polytheism. As to predestination itself, this he only allowed to exist with regard to the outward good or evil that befalls man, such as illness or recovery, death or life, but man's actions he held to be entirely in his own hands. God, he said, had given commandments to mankind, and it was not to be supposed that he had, at the same time, preordained that some should disobey these commandments, and that, further, they should be punished for it. Man alone was the agent in his good or evil actions, in his belief or unbelief, obedience or disobedience, and he is rewarded according to his deeds. These doctrines were further developed by his disciple, Abu-l-Hudail, who did not deny so absolutely God's "qualities," but modified their meaning in the manner of the Greek philosophers, viz., that every quality was also God's essence. The attributes are thus not without but within him, and so far from being a multiplicity, they merely designate the various ways of the manifestations of the Godhead. God's will he declared to be a peculiar kind of knowledge, through which God did what he foresaw to be salutary in the end. Man's freedom of action is only possibly in this world. In the next, all will be according to necessary laws immutably preordained. The righteous will enjoy everlasting bliss; and for the wicked, everlasting punishment will be decreed. Another very dangerous doctrine of his system was the assumption that, before the Koran had been revealed, man had already come to the conclusion of right and wrong. By his inner intellect, he held, everybody must and does know—even without the aid of the divinely given commandments—whether the thing he is doing be right or wrong, just or unjust, true or false. He is further supposed to have held, that unless a man be killed by violent means, his life would neither be prolonged nor shortened by "supernatural" agencies. His belief in the traditions was also by no means an absolute one. There was no special security, he said, in a long, unbroken chain of witnesses, considering that one fallible man among them could corrupt the whole truth.

Many were the branches of these Motazilites. There were, apart from the disciples of Abu-l-Hudail, of whom we have just spoken, the Jobbaians, who adopted Abu Ali

Al-Wahhab's (Al-Jobbâi's) opinion, to the effect, that the knowledge ascribed to God was not an "attribute;" nor was his knowledge "necessary;" nor did sin prove anything as to the belief or unbelief of him who committed it, who would anyhow be subjected to eternal punishment if he died in it, etc.—Besides these, there were the disciples of Abu Hashem—the Hashemites, who held that an infidel was not the creation of God, who could not produce evil. Another branch of the Motazilites were the disciples of Ahmed Ibn Hayet, who held that Christ was the eternal word *incarnate*, and assumed a real body; that there were two gods, or creators, one eternal, viz., the Most High God, and the other not eternal, viz., Christ—not unlike the Socinian and Arian theories on this subject; that there is a successive transmigration of the soul from one body into another, and that the last body will enjoy the reward or suffer the punishments due to each soul: and that God will be seen at the resurrection with the eyes of understanding, not of the body.

Four more divisions of this sect are mentioned, viz., the Jâhedhians, whose master's notion about the Koran was, that it was "a body that might grow into a man, and sometimes into a beast, or to have, as others put it, two faces—one human, the other that of an animal, according to the different interpretations." He further taught them, that the damned would become fire, and thus be attracted by hell; also, that the mere belief in God and the Prophet constituted a "faithful." Of rather different tendencies was Al-Mozdar, the founder of the branch of the Mozdarians. He not only held the Koran to be uncreated and eternal, but so far from denying God the power of doing evil, he declared it to be possible for God to be a liar and unjust.—Another branch was formed by the Pasharians, who, while they carried man's free agency rather to excess, yet held that God might doom even an infant to eternal punishment—all the while granting that he would be unjust in so doing.—The last of these Motazilite sectarians we shall mention are the Thamamians, who held, after their master, Thamâma, that sinners would undergo eternal damnation and punishment; that free actions have no producing author; and that, at the resurrection, all infidels, atheists, Jews, Christians, Magians, and heretics should be returned to dust. We cannot, in this place, enlarge upon the different schools founded by the Motazilites, nor upon the subsequent fate. The vast scientific development, however, which their doctrines begot, and which resulted in the encyclopædic labors called "The Treatises of the Sincere Brethren and True Friends," are touched upon under SINCERE BRETHREN (q. v.). See Weil, *Geschichte der Khalifen;* Sale's *Koran;* Steiner, *Mutaziliten;* Dieterici, *Transactions of the German Oriental Society*, etc.

MOTETT', a name applied to two different forms of musical composition—1. A sacred cantata, consisting of several unconnected movements, as a solo, trio, chorus, fugue, etc.; 2. A choral composition, generally also of a sacred character, beginning with an introduction in the form of a song, perhaps with figurative accompaniment; after which follow several fugue subjects, with their expositions, the whole ending either with the exposition of the last subject, a repetition of the introduction, or a special final subject. A motett differs in this respect from a double or triple fugue, that the subjects never appear simultaneously, but are introduced one after the other. In one form of the motett, the successive phrases of an entire chorale are treated as so many fugal subjects.

MOTH, the popular name of all the insects included in the section *Nocturna* of the order *Lepidoptera* (q.v.). They formed the genus *Phalæna* of Linnæus, but are now distributed into many genera and families, the species being extremely numerous. Among them are the very largest *Lepidoptera*, and also the smallest. They are distinguished from hawk-moths, and from most of the butterflies, by their bristle-shaped antennæ, tapering from base to apex. The antennæ are frequently feathered or pectinated, especially in the males. The proboscis is generally similar to that of butterflies; but there are some groups of moths in which it is merely rudimentary, and these are supposed to take no food after they pass from the larva state. The thorax is generally shorter and more robust than in butterflies; the tibiæ of the legs often bear a kind of spur; the wings are held either in a horizontal or in an inclined position when at rest; or, as in many of the smaller moths, are wrapped around the body. The two wings of the same side are generally hooked together in repose by means of bristles on the margin. The females of a few species are wingless.—Moths are generally nocturnal, although to this rule there are a few exceptions. They often exhibit great richness in beauty of colors, although in brightness of color they are not generally equal to butterflies. Their food is similar to that of butterflies.—They lay great numbers of eggs, which exhibit varieties of form and color as great as those of the insects themselves. Their caterpillars are more widely various in form and characters than those of the butterflies; differing from each other in the number of their legs, and in horns, protuberances, caudal appendages, hairy covering, etc. Some are social both in the larva and chrysalis state, forming, on their entering the latter state, very curious nests. The chrysalis of a moth is never angular nor furnished with protuberances, and is generally enveloped in a silken cocoon, pretty close and compact; although some moth chrysalids are found in a mere space filled with threads which cross each other in various directions. Silk-worm (q.v) moths are among the insects most useful to man; but moths in general are regarded by him as injurious, the larvæ of many feeding on leaves of various kinds, and often destroying valuable crops; and the larvæ of some small species proving very destructive to clothes, books, etc. The largest and most splendid moths inhabit tropical countries. Some of the most interesting and important kinds of moth are noticed in separate articles. Notwithstanding a popular dislike of moths, observation of their habits and of the richness of color of many of them, is a favorite pursuit of naturalists.

MOTHER CAREY'S CHICKEN, a name familiarly given by sailors to the storm petrel and other small oceanic species of Petrel (q.v.).—The name MOTHER CAREY'S GOOSE, is in like manner, given to the great black petrel or gigantic fulmar (*Procellaria gigantea*) of the Pacific ocean; a bird of about three feet in entire length, with very long wings, and blackish gray plumage, a ravenous feeder on dead whales and all other animal garbage, and which also kills and preys upon other sea-birds.

MOTHER OF PEARL, the shells of the large bivalve mollusk *Meleagrina margaritifera*, which also produces the precious pearls. See PEARL. These shells are collected in vast numbers in the tropical seas, chiefly on the coast of Ceylon, Manilla, Cuba, Panama, and the South Sea islands. Those from Panama are small and thick, and are known in commerce as "bullock" shells; those from Manilla are finest in quality, often as much as a foot in diameter, round and flat. There are two varieties—the white or silver-lipped, and the black-lipped. So enormous is the trade in these shells, that the imports of this country alone amount to 3,000 tons per annum, the value of which is nearly £100,000. Although large quantities of these shells are consumed in inlaying fancy wood work, papier-mâché, and in making knife-handles and other small ornamental objects, by far the greater portion is required for making buttons, chiefly in Birmingham.

MOTHER WATER, MOTHER LYE. See LYE.

MOTHERWELL, a town of Scotland, in Lanarkshire, eleven m. from Glasgow. Its progress, which of late years has been very rapid, is chiefly due to the coal mines in its neighborhood. Pop. (1861) 2,925; (1871) 6,943.

MOTHERWELL, WILLIAM, a Scottish poet and antiquary, was b. in Glasgow, Oct. 13, 1797, and educated chiefly at the grammar-school of Paisley, where, in his fifteenth year, he entered the office of the sheriff-clerk. At the age of twenty-one. he was appointed sheriff-clerk depute of the county of Renfrew. In the following year he published his first work, the *Harp of Reugrewshire*, containing biographical notices of the poets of that district, from the 16th to the 19th century. This work was but the prelude to one of far greater importance—his *Ministrelsy, Ancient and Modern*, which appeared at Glasgow in 1827. In 1828 he commenced the *Paisley Magazine*, in which some of his finest original pieces first saw the light, and in the same year accepted the editorship of the *Paisley Advertiser*, a conservative journal. In 1830 he became editor of the *Glasgow Courier*. He died in that city, Nov. 1, 1835, at the early age of 38. Motherwell displays in his best moods (but *only* then) a rich, beautiful, and strong imagination, great warmth and tenderness of feeling, and a thorough knowledge of the language of a poet. His *Jeanie Morison* is unsurpassed for the mingled pathos and picturesque beauty of its reminiscences of boyish love; *The Sword-Chant of Thorstein Raudi* is perhaps the most heroic rune in the English tongue; and the little piece beginning, "My heid is like to rend, Willie," has seldom been read without tears. An enlarged edition of his poetical remains, with a memoir, was published in London in 1849.

MOTHERWORT, *Leonurus Cardiaca*, a plant of the natural order *Labiatæ*, found about hedges and in waste places in Europe, and now abundantly naturalized in some parts of North America. It is not very common in Britain, and probably has been introduced. It is perennial, has a branched stem about three feet high, stalked leaves, the lower ones three-lobed, and crowded whorls of reddish-white flowers. The calyx has five pungent spreading teeth. The upper lip of the corolla is shaggy on the upper side, the lower lip trifid. The anthers are sprinkled with shining dots. The plant was formerly in much use as a domestic pectoral medicine, but is now comparatively little employed. It has a strong, but not agreeable smell.—Other species of the same genus are found in Europe and the n. of Asia.

MOTION, LAWS OF, are the fundamental principles connecting force and motion in the physical universe; and are obviously to be derived from *experiment* alone, since intuitive reasoning cannot possibly give us any information as to what may or may not be a law of nature. Though these laws are derived from experiment, it cannot be said that we have any very *direct* experimental proofs of their truth—our most satisfactory verifications of them are derived from the exact accordance of the results of calculation with those of observation in the case of such gigantic combinations of mutually influencing bodies as that of the solar system; and it is by such proofs that they must be considered to have been finally established.

They seem first to have been given systematically and completely by Newton, at the opening of the *Principia;* but the first two were known to Galileo, and some of the many forms of a *part* of the third were known to Hooke, Huyghens, Wren, and others. We shall give them here in order, with a few brief comments, showing their *necessity* and their *use*.

First, then, we naturally inquire, what matter would do if left to itself; and, by considering cases in which less and less external force is applied to a body, we are led to the statement called the *first law of motion:*

1. *Every body continues in its state of rest or of uniform motion in a straight line, except in so far as it may be compelled by impressed forces to change that state.*

This expresses simply the *inertia* of matter—i.e., a body cannot alter its *state* of rest or motion; for any such alteration external *force* is required. Hence the definition of force (q.v.), as that which changes or tends to change a body's state of rest or motion.

Now, how does the change of state depend on the force which produces it? This is obviously a new question, to be resolved by experiment; and the answer is the *second law of motion:*

2. *Change of motion is proportional to the impressed force, and takes place in the direction of the straight line in which the force acts.*

Newton's silence is as expressive as his speech. Nothing is here said about the previous motion of the body, or about the number of forces which may be at work simultaneously. Hence, a force produces its full effect in the form of change of motion, whether it act singularly, or be associated with others; and whatever, moreover, be the original motion of the body to which it is applied. Hence, there is no such thing as equilibrium of *forces*; every force produces motion—and what we call equilibrium is *not* the balancing of forces, but the balancing of their *effects*. Hence, the absurdity of attempting to found the science of statics on any other basis than is to be derived from the second law of motion; which, in fact, leads us at once (by the *parallelogram of velocities*, which is a purely geometrical conception) to the *parallelogram of forces*, and thence, with the help of the third law, to the whole subject of statics. The second law also supplies the means of measuring *force* and *mass;* and of solving any problem whatever concerning the motion of *one* particle.

But more is required before we can study the motion of a *system* of particles—as a rigid body, or a liquid, for instance; or a system of connected bodies. Here there are mutual actions and reactions of the nature of pressure or of transference of *energy* (see FORCE) between the parts—and these are regulated by the *third law of motion:*

3. *To every motion there is always an equal and contrary reaction: or, the mutual actions of any two bodies are always equal and oppositely directed in the same straight line.*

Thus, the mutual pressure between two bodies has equal, but *opposite*, values for the two. The tension of a rope is the same throughout, and tends as much to pull *back* the horse at one end as to pull *forward* the canal-boat at the other. The earth exerts as much attractive force on the sun as the sun exerts on the earth—and the same law applies to the other attractive and repulsive forces, as those of electricity and magnetism.

But Newton goes much further than this; he shows, in fact, that action and reaction (subject to the third law) may consist in *work done by a force*, instead of the mere force or pressure itself. From this form of the third law we derive at once the principle of virtual velocities (q.v.), which in its application to machines is familiar as "*What is gained in power is lost in speed.*" But we also derive the grand principle of the indestructibility of work or energy; at all events in the case of the ordinary mechanical forces—and this must be regarded as one of the grandest discoveries which science owes to Newton. It is true that he merely *mentions* it, and then abruptly passes to another subject; yet we can hardly exaggerate the value of this single remark. Experimenters, mainly Davy and Joule, have since shown that all the physical energies, as heat, light, electricity, etc., are subject in their transformations to the third law of motion, and thus the system constructed by Newton for ordinary dynamical purposes, is now found to rule the most mysterious of the affections of matter. For a development of this, see our article on FORCE.

MOTION, ANIMAL. Motion or progression is that function by which an animal is able to transport itself from place to place. It is enjoyed exclusively by animals, there being nothing strictly analogous to it in the vegetable kingdom. The organs employed in locomotion are of two kinds, the *passive* and the *active;* the former including all those textures which form the skeleton, and by which its segments are united, as fibrous and areolar tissue, synovial membrane, cartilage, fibro-cartilage, and bone, while the latter includes the muscles with the nerves, which convey to them the mandates of the will.

Before proceeding to notice the different modes of progression of men and animals, it may be expedient to say a few words on *standing*, or the natural attitude of an animal. This attitude depends upon the form and functions of the limbs. Most of the terrestrial mammals and the reptiles (excepting the serpents), both of which use four feet in walking, have the backbone (the vertebral column) nearly horizontal (being only slightly concave downwards), and resting, at the same time, both on the fore and hind legs. Birds, whose anterior extremities are intended for flight, stand upon the posterior limbs only, although in their case, too, the backbone is generally nearly horizontal when the animal is at rest. Man alone stands erect with his head supported on the summit of the nearly vertical vertebral column. Some other animals (monkeys, hares, kangaroos, etc.) can rise more or less erect, but in their case the attitude is obviously not the natural one.

In standing it is requisite that the limbs should be so arranged that the center of gravity may fall within the space included by the feet. If the center of gravity does not fall within this space the animal cannot stand, but must fall to that side to which the center of gravity inclines. On this account certain aquatic birds (the albatross, for example), which have their feet placed very far back, cannot use them for walking. If an animal has four legs, it is not necessary that they should have the broad base, which is essential in bipeds. We see that most quadrupeds have comparatively small feet, while birds are furnished with long toes, which, when spread out, form large bases of support. Moreover, the flexor muscles of the toes are so arranged that the weight of the body causes them to contract firmly, and hence birds are enabled to sleep standing without any effort.

Walking is the most common form of progression. When it is accomplished by two legs only, as in man, the body is inclined forward, carrying the center of gravity in that direction; and while one leg supports the body the other is thrown forward to prevent it from falling, and to sustain it in turn. Hence, walking has been defined to be a continual falling forward, interrupted by the projection of the leg. Those writers who have especially studied the theory of walking (Borelli, the brothers Weber, and Bishop) have divided the time of a step into two portions—i.e., that in which one leg only rests on the ground, and that in which both legs rest on the ground. The period in which both feet are on the ground is shorter than that in which the body is supported by one leg only. During the time the body is supported by one leg, the other leg swings from behind forward, without the active intervention of its muscles, but by the mere force of gravity—in short, like the pendulum of a clock. When this leg is again placed on the ground the first interval ends, and the other—i.e., that in which the body is supported by both legs—begins, and, of couse, terminates with the raising of the other leg. The time that the body is supported by both legs diminishes as the velocity increases, and vanishes as the walk merges into a run; while, on the other hand, it attains its maximum in extremely slow walking, when it is found by experiment to amount to half the time in which only one leg supports the body. The greatest velocity of walking is attained when the time of a step is equal to half the duration of the motion of the swinging leg, and the velocity in walking of any given person depends on the time taken in making each step, and on the length of the steps; and both of these are, again, dependent on the height at which the center of gravity of the body or the heads of the thigh-bones are carried above the ground; for as the height of the latter diminishes, the length of the step is increased, while its time is diminished, and *vice versa*. The best walkers are incapable of acquiring a speed of more than 7 m. an hour; and even this speed cannot be kept up for any length of time. The walking of quadrupeds is a similar process to that of bipeds, except that the body always rests on at least two legs. The limbs are raised in a determinate order, and usually in such a manner that the hind-leg of one side succeeds the fore-leg of the opposite side.

Running consists of the same succession of motions as walking; but these motions are so accelerated that there is a period between two steps when the body is not supported on either leg; and this constitutes the essential difference between the two paces. It requires a far greater expenditure of muscular force than walking, and cannot be long maintained without considerable exhaustion. First-rate runners can accomplish a mile in a few seconds under four minutes and a half, and 10 m. in an hour. (Levett in a match with Frost, which came off on Mar. 22, 1852, at Copenhagen Fields, ran 10 m. 250 yds. in 52' 53", and Deerfoot ran 11 m. 740 yds. at Brompton in an hour). In quadrupeds there are various paces besides walking, which are known as trotting, cantering, and galloping; and as every one is familiar with the ordinary paces of the horse, we shall take that animal as our illustration. In *trotting*, the horse moves its legs in pairs diagonally. Thus, if the left fore and right hind-leg be raised, and advanced first, the right fore and left hind-leg will be raised the instant the others reach the ground. In fact, in trotting, the first pair are actually raised before the other legs reach the ground, so that there is a minute interval when all four legs are raised above the ground at the same time. The velocity acquired by moving the legs in pairs (as in running), instead of consecutively (as in walking), depends upon the circumstance that in trotting each leg rests on the ground during a short time and swings during a long time, while in walking the swing occupies a short period, and the rest a comparatively long one. In *cantering*, the animal, after advancing the two fore-legs one after the other, brings forward the two hind-legs simultaneously; and when this movement is greatly urged, the fore-legs are raised together, as well as the hind-legs, and the pace then becomes the *gallop*.

In *leaping*, the horse raises the fore-legs from the ground, and propels the body upward and forward by the hind legs alone. This act in the horse is, however, mainly the result of education, and those animals that leap or spring upon their prey (as the members of the cat tribe) crouch before leaping, in order to throw the body forward with the greatest possible force, by first bending all the limbs, and then suddenly extending them. As the hind legs are, however, the essential agents in leaping, we observe that in those animals whose natural mode of progression is leaping—as frogs, hares, kangaroos, etc.—the hind legs are much longer, and more muscular than the fore-legs. Leaping is a common mode of progression in many short-legged birds (blackbirds, thrushes, finches, sparrows, etc.), in which the step would be extremely short if performed by moving the legs alternately. There is also a large number of insects, such as grasshoppers, fleas, etc., whose ordinary mode of progression is by leaps; and it is in this class of animals that the leaping power is developed to its greatest extent. The common flea, for example, can leap 200 times its own length. While fleas, locusts, and grasshoppers leap by means of their long and strong hind legs, other insects, as the *poduridæ*, or spring-tails, possess a forked tail, which they bend beneath the body, and which, when suddenly extended, propels them to a considerable distance.

Climbing, is merely walking on an inclined or vertical surface. It is usually accomplished by means of sharp nails or claws, as in the cat-tribe, the lizards, etc. In many birds, as the woodpeckers, parrots, etc., the toes are arranged in two divisions, so as to grasp branches in the manner of a hand. Bears and sloths use their arms for climbing, while monkeys use their hands, and in some cases their tails. It is only in a very few cases, as in the sloth, that this is the ordinary method of progression.

The act of *flying* in the bird is accomplished by the simultaneous action of the two anterior limbs, the wings, much as leaping is by that of the two posterior limbs. See FLYING: BIRDS. Many attempts have been made to estimate the velocity at which different birds can fly. Whether, as has been stated, the eider-duck can fly 90, and the hawk 150 m. in an hour, is very questionable; but it has been ascertained that carrier-pigeons can accomplish from 38 to 42 m. in that time.

The bats are the only mammals which possess a true power of flight. For a description of their organs and mode of flight, we must refer to the article BAT, where will also be found a notice of the false claims of some other mammals, as the so-called flying-squirrel, to the possession of true flight. Similarly, the actions of the flying lizard and of the flying-fish are not true flight. In no class of animals is the mechanism of flight so perfect as in insects. The dragon-fly, for example, can outstrip the swallow; and can do more in the air than any bird, as it can fly backwards and sidelong, to right or left, as well as forward without turning. The wings of insects, of which there may be either one or two pair, are analagous (as instruments of motion) to the feathered wings of birds, but are regarded as homologous to (or in their essential nature) branchiæ or respiratory organs. For details regarding the mechanism employed in their aërial progression by insects, see INSECTS.

Swimming is the mode of progression employed by most aquatic animals. It mainly differs from flying in this respect, that water being much more dense than air, and the body of the animal being nearly of the same weight as the water it displaces, very little effort is required to keep the animal from sinking, and hence almost the whole of the muscular force can be employed in progression. In fishes, the locomotive organs consist of the fins and tail, the latter being the great propelling organ. The swimming of a fish has been correctly compared to the motion of a boat propelled by a single oar or scull at the stern. In the same manner as a succession of strokes alternately right and left propels the boat straight forward, so the fish advances by striking alternately right and left with its tail, The caudal fin, in which the tail ends, is vertical in fishes, and is usually considerably forked, when there is great speed. The ventral fins are for the purpose of keeping the fish in its proper position, with the back upwards, as is shown by a well-known experiment of Borelli, who, after cutting off these fins, restored the living fish to the water, when it rolled from side to side like a drunken man. The air-bladder with which many fishes are provided, and which they can distend and contract at pleasure, facilitates their swimming by enabling them to modify their specific gravity. Most terrestial mammals, excepting man, swim at once the first time they find themselves in deep water. The reason of this is, that their limbs move in water precisely as they do on land, and no new action either as regards direction or order is required, as is the case with man, to enable them to swim. Those which frequent the water, as seals, otters, and beavers, have webbed feet like ducks and other palmiped birds, the toes being united by membranes, which, when expanded, act as paddles. A large number of invertebrate animals move chiefly by swimming. Thus lobsters move by means of a vertical motion of the tail, and many of the crabs by means of their posterior legs, which are fashioned like oars. Many insects swim with their legs, which are fringed with hairs to give additional surface. The cuttle-fish uses its long arms as oars, and darts through the water with extreme rapidity; while other mollusks erect sail-like organs, by which they are propelled along the surface of the water. SWIMMING, as a gymnastic exercise, is described in a separate article.

Notices of the more special modes of progression will be found under a variety of heads. See CRUSTACEA, SERPENTS, WORMS.

MOTION, in Plants. See IRRITABILITY and SPORE.

MOTIONS, a name given to certain dramatic exhibitions, illustrating scriptural narrative, which prevailed in England in the 15th c. and later. The characters were represented by wooden puppets, while the dialogue was spoken behind the scenes.

MOTIVE, or MOTIVO, in a musical composition, means the principal subject on which the movement is constructed, and which, during the movement, is constantly appearing in one or other of the parts, either complete or modified. In elaborate and long compositions there are also secondary motives.

MOTLEY, JOHN LOTHROP, LL.D., D.C.L., etc., American historian, was b. at Dorchester, Mass., April 15, 1814. After graduating at Harvard university, he spent a year at Göttingen, another at Berlin, and traveled in Italy and other parts of southern

Europe. Returning to America, he studied law, and was admitted to the bar in 1837; but preferring literature, he wrote a historical romance, entitled *Morton's Hope* (1839), which had little success. In 1840 he received the appointment of secretary of legation to the American embassy to Russia, but soon resigned, and in 1849 published another unsuccessful novel, entitled *Merry Mount, a Romance of the Massachusetts Colony*. He attracted attention, however, by some valuable historical essays for American reviews, among which may be mentioned one on De Tocqueville's *Democracy in America*, and another on "Peter the Great;" and having planned a history of Holland, he proceeded to Europe for materials, and after five years' labor, published in 1856 *The Rise of the Dutch Republic*. In 1860 appeared a continuation of it: *The History of the United Netherlands from the Death of William the Silent to the Synod of Dort.* Motley was appointed in 1861 U. S. minister at the court of Vienna, a post from which he was recalled in 1867. In 1869 he was sent as minister to the court of St. James, but was recalled the following year. In 1874 he published *The Life and Death of John of Barneveldt, Advocate of Holland; with a View of the Primary Causes and Movements of the Thirty Years War* (2 vols.). He died May 29, 1877.

MOTMOT. See Momotidæ.

MOTRIL', a town of Spain, in the province of Granada, and 35 m. s. of the city of that name, in a productive district 3 m. from the sea. Agriculture and fishing are the principal employments of the inhabitants. Pop. 14,000.

MOTT, Gershom, b. N. J., 1822; served through the Mexican war, and in 1861 raised a regiment of volunteers from his native state. He took part in McClellan's peninsula campaign, was wounded at the second battle of Bull Run, and again at Chancellorsville, where he commanded the 2nd N. J. brigade. He was at Gettysburg, and the next year was brevetted maj.gen. In the last campaign against Richmond, he was in command of the 2nd division of the 4th corps. He was made full maj.gen. in 1865.

MOTT, Lucretia, 1793–1880; b. Mass.; married James Mott in 1811. She taught school in Philadelphia in 1817, and the next year became a preacher in the society of Friends. She made a tour through New England and the middle states, preaching, and denouncing slavery and intemperance. She helped organize the American anti-slavery society in 1833, was a delegate to the "world's anti-slavery convention" at London in 1840, and participated in the first women's rights convention in 1848. For the rest of her life she continued her advocacy of woman-suffrage and her opposition to slavery. After the division in the society of Friends in 1827, she sided with the Hicksites.

MOTT, Valentine, ll.d., 1785–1865; b. N. Y.; graduated in medicine at Columbia college in 1806, and afterwards studied in London and Edinburgh. He was appointed professor of surgery in Columbia college in 1809, which place he filled till the medical department of that institution was united with the college of physicians and surgeons in 1813, and for 13 years afterwards. He then, in 1826, with Drs. Hosack, Francis, Mitchill, and others, founded the Rutgers medical college, which, owing to difficulties in regard to its charter was disorganized four years afterwards. He was for several years professor of surgery in the medical department of the university of New York. Dr. Mott was celebrated as a skillful operator in all branches of operative surgery, but more particularly for the ligature of arteries, in which his experience and success was greater than that of any other (see Ligature). He introduced an operation for immobility of the lower jaw, and in 1821 performed the first operation for osteo-sarcoma of that member. He performed the operation of lithotomy 165 times, and amputated more than 1000 limbs. Sir Astley Cooper said of him that he had performed more of the *great* operations than any man, living or dead. He visited Europe in 1835, and traveled in England, on the continent and in the east, publishing an account of his travels in 1842. He was not a voluminous writer, the scalpel being more congenial to his hand than the pen. He, however, found time to translate Velpeau's *Operative Surgery* (4 vols. 8 vo.) and to furnish several papers or the notes of them for the transactions of the New York academy of medicine. His cliniques were reported by Samuel W. Francis in 1860.

MOTTE, Rebecca (Brewton,) 1740–1815; b. South Carolina; married Jacob Motte, a planter. At the time of the revolution she was a widow, and resided in a house on the Congaree river, which was taken as a garrison by British soldiers. Through her aid the house was set on fire, and all the garrison captured by Marion and Lee. Her biography may be found in Mrs. Ellet's *Women of the Revolution*.

MOTTE (or MOTHE) CADILLAC, Sieur Antoine de la. See Cadillac.

MOTTEVILLE, Françoise Bertaut de, Dame Langlois de, 1621–89; b. France; daughter of a gentleman of the court and the lady's maid of Anne of Austria, whom she succeeded. At the age of 18 she was made to marry de Motteville, who was 80, and died at 82. After his death she seemed never to have a desire for marriage. Brought up at court when Richelieu was its central figure, forced to leave it with Anne of Austria, when the latter was banished from it by that minister, returning at his death; during all the years of her life devoted to her patroness, and to her memory after death she seems in the midst of a court where passions and intrigues were nearly universal, to have kept herself free from all. For this reason the journal of daily events which she kept during much of her life, written with the straightforward simplicity of a meditative character which made those quiet observations her pastime, has become one of the most valuable sources of information concerning the characteristics of the court people of her time. It was published in 1723 under the title of *Mémoires pour servir a l'histoire d'Anne d'Autriche.*

MOTTO, in heraldry, a word or short sentence which forms an accompaniment to a coat-of-arms, crest, or household badge. Mottoes were originally attached to the badge when the family had one, or to the crest where there was no badge. In later heraldry, the practice is to place the motto in an escrol either over the crest or below the shield. A motto is sometimes a religious or moral sentiment, as "Gardez la foi," "Humanitate;" it is not unfrequently a heroic exclamation or war-cry, "Courage sans peur," "Forward." In a great many cases it bears reference to the crest, badge, or some bearing of the escutcheon; thus, Stuart, earl of Moray, has for crest a pelican wounding herself, and for motto, "Salus per Christum Redemptorem;" and not a few mottoes are punning allusions to the family name—as Scudamore, "Scuto amoris Divini;" Vernon, "Ver non semper viret;" "Fare, fac," for Fairfax; and "Time Deum, cole regem," for Coleridge. Two mottoes are sometimes used by the same family—one above the crest, the other below the shield. The motto, "Dieu et mon Droit," which accompanies the royal arms of Great Britain, is supposed to have been a war-cry, and was used in England at least as early as the time of Henry VI. Its origin has been assigned to a saying of Richard I., "Not we, but God and our right have vanquished France."

MOUFFLON, or MUSMON, *Ovis* or *caprovis musimon,* the wild-sheep of Corsica, Sardinia, Cyprus, Greece, etc. It is about the size of a small fallow-deer, covered with hair and not with wool, except that hair of a somewhat woolly character appears in winter. The upper parts are brownish, the under parts whitish; the hair of the neck is long; the tail is very short. The horns of the male are very large, approaching to those of the argali. The moufflon lives chiefly in the higher parts of mountainous regions, and is not easily approached by the hunter.

MOULD, or MOULDINESS, the common name of many minute fungi which make their appearance, often in crowded multitudes, on animal and vegetable substances, either in a decaying or in a living but morbid state, To the naked eye they often seem like patches or masses of fine cobweb, and are discovered by the microscope to consist of threads more or less distinctly jointed, sometimes branched., Some species of mold occur on many different substances; other seem to be peculiar to substances of particular kinds, as decaying pears, decaying gourds, etc. Some of the moulds belong to the suborder of fungi called *physomycetes.* See FUNGI. One of these is the COMMON MOULD (*mucor mucedo*), so plentifully found on fruit, paste, preserves, etc., in a state of incipient decay, the progress of which it hastens. It consists of cobweb-like masses of threads, from which rise many short stems, each bearing at the top a roundish membranous blackish spore-case.—A nearly allied, and also very common species, is *ascophora mucedo,* which forms a bluish mould on bread. From a spreading cobweb-like bed rise long slender branches, terminated by spore-cases, of which the vesicle collapses into the form of a little *pileus.*—An interesting species of mould, remarkable for its luxuriance and beauty of colors—at first white, then yellow, with orange spore-cases, then shining green or olive, and with threads often several inches long—grows on fatty substances.—Other species of mould are ranked among *hyphomycetes,* a suborder of fungi, having a floccose thallus and naked spores. One of these is the BLUE MOUD (*aspergillus glaucus*), which imparts to cheese a flavor so agreeable to epicures, and perhaps marks it as in a condition most suitable for promoting the digestion of other aliments, of which epicures eat too much. Advantage is often taken of the fact that a small portion of cheese affected with mould will speedily infect sound cheese into which it may be introduced. It is one of the few cases in which the propagation of these fungi is ever desired and sought after by man.—SNOW MOULD (*lanosa nivalis*) is found on grasses, and especially on barley and rye beneath snow, often destroying whole crops. It appears in white patches of a foot or more in diameter, which finally become red as if dusted with red powder.

Even living animals are liable to be injured by fungi of this kind. Silk-worms are killed in great numbers by one called MUSCARDINE (q.v.), or SILK-WORM ROT. Such fungi are sometimes developed on the mucous membrane and in internal cavities of vertebrated animals; and on the bodies of invertebrate animals, as the common house-fly, which, in the end of autumn, when it becomes languid, often dies from this cause. Even strongly-scented substances, if moist, are liable to be attacked by mould of one kind or other; nor are strong poisons, either animal or vegetable, a sufficient safeguard. *Ascophora mucedo,* springs up readily in paste full of corrosive sublimate; and the mycelium of moulds is found in strong arsenical solutions. The only sure preventive of mould is dryness. Many of the moulds vegetate is liquids, but do not attain their perfect development, only appearing as filamentous and flocculent mycelia. The *vinegar plant* (q.v.) is an instance of this kind.

Mildews and moulds are very nearly allied.

The rapidity with which these fungi are produced is marvelous. "In favorable circumstances, a plant will pass through every stage of growth to perfect maturation of its seeds in less than two days, the threads which sustain the ripe sporangia being so long, and yet so delicate, as to make it a marvel that they can remain erect."—(*Berkeley.*)

MOULD, the model or pattern from which workmen execute mouldings, ornaments, etc. Also, the shape or bed in which metal and other castings are made.

MOULD, Jacob Wrey, b. England, 1825; educated in Cork, Ireland, for matriculation at King's college, London, which he entered in 1839, graduating with honors in 1842. He was then articled to the celebrated architect, Owen Jones, and executed with his own hands, from casts or from Mr. Jones's sketches, illustrations of the second volume of *The Alhambra.* Soon after he produced illuminated illustrations for *Gray's Elegy*, the *Book of Common Prayer*, and a considerable part of Owen Jones's *Grammar of Ornament.* In 1849 he became associated with Lewis Vuliamy a London architect, and during the illness of his patron designed and erected the beautiful mansion at Stanhope Gate, Hyde Park, London, on the site of the marquis of Hereford's *Gaunt House.* After its completion, he was again associated with Owen Jones in the construction and decoration of the Moresque-Turkish divan at Buckingham palace, and in the decoration of the exhibition building of 1851. A few years later he came to the United States and was engaged by Moses H. Grinnell to design and superintend the erection of All Souls (Unitarian) church, on 4th avenue, New York city; a building which, by its departure from previous models in that city, excited lively attention and criticism. In 1857 he was appointed assistant on the architectural staff of the Central Park commissioners, associated with Calvert Vaux, the chief architect. From that time until 1874, Mould, as assistant architect, designed the details of the bridges, terraces and architectural structures in the Central park. In 1870 Mould was made architect-in-chief of the department of public parks, and retained that place until 1874, when he was removed by a change of commissioners. The same year he was invited to Lima, Peru, to execute architectural work for Henry Meiggs, and was there working out his designs when the death of Meiggs, in 1877, and the war with Chili soon after, necessitated his return to New York in 1879. He has recently (1880) been appointed by the park commissioners of New York city, to design the architectural features of the new Morningside park.

MOULDING. See Founding, *ante.*

MOULDINGS, the curved and plane surfaces used as ornaments in cornices, panels, arches, etc., and in all enriched apertures in buildings. In classic architecture the mouldings are few in number, and definitely fixed in their forms. There are eight kinds of these regular mouldings, viz, the Cyma, the Ovolo (or Echinus), the Talon, the Cavetto, the Torus, the Astragal, the Scotia, and the Fillet (q.v.); and each of these mouldings has its proper place assigned to it in each order. See Column. In Gothic architecture, and all other styles, the mouldings are not reduced to a system as in the Greek and Roman styles, but may be used in every variety of form at the pleasure of the artist. Certain forms generally prevail at one period in any style. Thus, in Gothic architecture, the date of a building may in many instances be determined by the form of the mouldings. The Norman mouldings were very simple in outline, and very frequently enriched with the zigzag and billet ornaments.

In the early English style, the mouldings are also simple in outline, and are usually arranged in rectangular divisions, and consist of alternate rounds and hollows. In late examples of this style, the fillet was introduced and led to the more elaborate form of mouldings during the decorated period.

The mouldings of the perpendicular style are generally flatter and thinner than the preceding, and have large hollows separated by narrow fillets, which produce a meager effect.

Each of these styles has its peculiar ornaments and style of foliage; and when these are used along with the mouldings, there is no difficulty in determining the approximate date of a building.

MOULINS, a t. of France, capital of the department of Allier, on the right bank of the river Allier, here crossed by a handsome stone bridge of 13 arches, lies 213 m. by railway, s.e. of Paris, and 95 m. n.w. of Lyons. Moulins was formerly the capital of Bourbonnais. It is a clean, well-built town, with pretty promenades. The principal buildings are the cathedral of Notre Dame (for the enlargement of which the sum of one and a half million francs was granted in 1852), the museum, the theater, the public library containing 20,000 vols., the new town-house, the palace of Justice, and the college. Of the old castle, built by the duc de Bourbon in 1530, only a square tower remains, which is used as a prison. Moulins carries on trade in coal, wood, iron, grain, wine, oil, and cattle. Pop. '76, 21,122.

MOULMEIN', a t. in the province of Tenasserim, British Burmah, situated on the gulf of Martaban, in the e. of the bay of Bengal, at the junction of the rivers Salween, Gyne, and Attaran, in 16° 29′ n. lat., and 97° 38′ e. long. Moulmein, one of the healthiest stations in India, is a pretty specimen of an eastern town. It is divided into five districts, each of which is under a goung or native head of police. The streets are, for the most part, shaded with trees, principally of the acacia tribe, and the glossy jack is often seen half covering a native house, its great fruit, as large as a child's head, ripening in the sun. The principal street, about 3 m. in length, runs due n. and s., and parallel with the river Salween. The native houses are constructed in the usual Burman style of bamboo, and a thatch made of the leaf of the water-palm. All are raised on piles, according to the universal custom of the country. Men walk about with the green paper chattah, or Chinese umbrella, used throughout the provinces; the *gharei*, or India cab, dashes along, the attendant imp reveling in heat and dust.

Moulmein is backed by a fine range of hills, on whose heights flash the gilded spires of innumerable pagodas; and here, too, are built many pretty residences, commanding a fine view of the town, river, and adjacent country, which for picturesque beauty and varied scenery has few equals. Moulmein boasts various churches, chapels, and missionary establishments, several charitable and educational institutions, substantial barracks, a general hospital, public library, etc. Vessels drawing 10 ft. of water can come up to Moulmein under charge of pilots from Amherst, and at spring-tide ships of any tonnage may reach the town. The rise and fall of the water is at that time from 20 to 23 feet. The population of Moulmein is steadily, if slowly, on the increase. In 1856 it was 43,683; in 1872, it had reached 46,242. Of these, divided according to their religion, about 27,000 were Buddhists, 11,000 Hindus, 6,000 Mussulmans, and 2,000 Christians. The mean temperature of Moulmein for the year 1872 was 78°—the highest being 96° in April, and the lowest 61° in Jan. As to nationality, besides the Burmans proper, the inhabitants of Moulmein include Eurasians or half-castes, Taliens, Chinese, Shans, Karens, Armenians, Jews, Malays, and natives of Hindustan.

Moulmein possesses great facilites for ship-building, and many fine vessels have lately been constructed in the building-yards of Tavoyzoo and Mopoon. The principal exports from Moulmein are teak-timber and rice; the imports consist of general merchandise, chiefly piece-goods, hardware, provisions, and sundries.

See *The Tenasserim and Martaban Directory*; Winter's *Six Months in British Burmah* (London, 1858); Marshall's *Four Years in Burmah* (London, 1860); *Blue-Books.*

MOULTING is the term applied by naturalists to the periodical exuviation, or throwing off of certain structures, which are for the most part of an epithelial or epidermic character. Thus, in a considerable number of the *articulata* the external covering is thrown off and replaced many times during life. In some of the minute entomostracous crustacea of our pools, a process of moulting, similar to that which occurs in crabs and lobsters, occurs every two or three days, even when the animals seem to have attained their full growth. In the crabs, in which the process has been carefully observed, the *exuvium*, or cast-off shell, consists not only of the entire external covering, including even the faceted membrane which forms the anterior coat of the compound eyes, but also carries with it the lining membrane of the stomach, and the plates to which the muscles are attached. During growth this moulting takes place as often as the body becomes too large for the shell; and after the animal has attained its full size it is found to occur at least once a year, at the reproductive season. During the early growth of insects, spiders, centipedes, etc., a similar moult is frequently repeated at short intervals, but after they have attained their full size no further moulting takes place. In the *vertebrata* we have examples of as complete a moulting, and replacement of new skin, among frogs and serpents as occurs in the articulata, the whole epidermis being thrown off at least once, and, in some instances, several times yearly. In birds the feathers are periodically cast off and renewed; in mammals generally the hair is regularly shed at certain periods of the year; and in the deer tribe the casting off and renewal of the antlers must be regarded as a special example of moulting. In man the continual exuviation of the outer layers of the epidermis is a process analogous to that which takes place on a more general scale in the lower animals.

MOULTON, Ellen Louise Chandler, b. Conn., 1835; married William V. Moulton, a Boston journalist, in 1855. Besides many contributions to periodicals, chiefly of fiction and poetry, she has published *This, That, and the Other*, 1854; *Juno Clifford*, 1855; *My Third Book*, 1859; *Bedtime Stories*, 1873; *Some Womens' Hearts*, 1874; *More Bedtime Stories*, 1874; *Poems*, 1877; and *New Bedtime Stories*, 1880.

MOULTON, Jeremiah, 1688–1765; b. Me.; stolen by the Indians while a child, but eventually returned on the release of some Indian prisoners. In 1724 he commanded the forces that captured the town of Norridgewock from the Indians. He was afterwards prominent in Maine as a judge of the court of common pleas.

MOULTRIE, a co. in e. Illinois, intersected by the Chicago and Paducah railroad, and the Illinois Midland, with a junction at Lovington, and the Decatur, Mattoon and Southern railroad, connecting with the Chicago and Paducah at Sullivan; 350 sq.m.; pop. '80, 13,705—13,269 of American birth, 16 colored. Its surface is generally level and well timbered, and its fertile prairies are drained by the head waters of the Kaskaskia river. Grain and live stock are the chief products, and it is a good grazing country. Co. seat, Sullivan

MOUL'TRIE, Fort, a fortress on Sullivan's island, at the mouth of Charleston harbor, S. C., celebrated for the repulse of a British squadron commanded by sir Peter Parker, Jan. 28, 1776. The fort, at that time, was hastily built of palmetto logs and sand, with 31 guns and 435 men. The spongy wood of the palmetto was found to resist the cannon balls perfectly. The fort was afterwards rebuilt, and in April, 1861, took part in the reduction of fort Sumter, and the commencement of active hostilities in the civil war of secession.

MOULTRIE, John, d. 1773; b. Scotland; a physician who emigrated to this country about 1730, and, settling in Charleston, secured a large practice.

MOULTRIE, John, 1799–1874; b. London; educated at Eton—where he was associate editor, with Hartley Coleridge and W. M. Praed, of the *Etonian*—and at Cambridge. He took orders in the English church, and was made rector of Rugby church, where he remained for the rest of his life. He published a volume of *Sermons* in 1852, and the same year edited the *Poetical Remains* of his fellow-Etonian, W. Sidney Walker. In 1845 he edited the works of Gray, and in 1854 his own complete *Poems* were published.

MOULTRIE, William, 1731–1805; b. S. C.; son of Dr. John, a Scotch physician who settled in Charleston early in the century. He received an ordinary education, and in the Cherokee troubles of 1761 was a capt. in the militia. Though of British descent and closely connected with many tories, Moultrie was prominent in the popular movements which preceded the revolution; in 1775 was a delegate to the colonial congress, and in the same year was chosen col. of a S. C. regiment. He assisted in the seizure of the arsenals and forts, placed a battery at Haddrill's Point, which drove off two blockading vessels, and when the siege of Charleston by the fleet of sir Peter Parker and sir Henry Clinton's land forces was threatened, obtained permission to construct a fort of palmetto logs on Sullivan's island, which he began in March, 1776. (See Moultrie, Fort.) Gen. Lee, the commander-in-chief, thought the position poor and the construction faulty, but when on June 28 the fleet appeared, the terrific cannonade of the ships produced little effect on the soft palmetto wood, while Moultrie, though poorly supplied with ammunition, made every shot tell, and at night the fleet retired with a loss of 225 killed and wounded, the colonial forces having but 36 men disabled. This remarkable and gallant defense resulted in the ultimate withdrawal of the British forces from the coast of South Carolina. Moultrie received the thanks of congress, and in his honor the fort was named fort Moultrie. In September of the same year Moultrie was made a brig.gen. and put in command of the department of Georgia and South Carolina. In 1779 the British forces again appeared, and under col. Gardner were defeated by gen. Moultrie near Beaufort. When gen. Prevost was advancing upon Charleston, Moultrie obstructed him in every possible way, and thus gave the city time to prepare for its defense. In the defense of the city he again displayed military ability, was held a prisoner for two years after the surrender, and at last exchanged for gen. Burgoyne. In 1782 he was made a maj.gen.; in the years 1785 and 1794 was elected governor of his state, and then retired to private life. His *Memoirs of the Revolution* (1802) was written in part while he was a prisoner, and finished in later years.

MOUND (Lat. *mundus*), in heraldry, a representation of a globe, surmounted with a cross (generally) pattée. As a device, it is said to have been used by the emperor Justinian, and to have been intended to represent the ascendency of Christianity over the world. The royal crown of England is surmounted by a mound, which first appears on the seal of William the conqueror, though the globe without the cross was used earlier.

MOUND BIRD. See Brush Turkey.

MOUNDS, and Mound Builders. See America (American Antiquities), *ante*.

MOUNDSVILLE, county town of Marshall co., W. Va., pop. 2,000. Near it is a large mound 75 ft. high, sometimes called the largest in the country, and from which it takes its present name, having been once called Grave Creek.

MOUNT, in heraldry. When the lower part of the shield is occupied with a representation of ground slightly raised, and covered with grass, this is called a mount in base; e.g., argent, on a mount in base, a grove of trees ppr.—Walkinshaw, of that ilk, Scotland.

MOUNT, William Sidney, 1807–68; b. on Long Island; until about 17 years old worked on his father's farm. He was made apprentice to his brother, a sign painter in New York city; displayed a taste for art; entered the school of the academy of design in 1826, and in 1829 began the work of portrait painting in New York. Among his best portraits were those of gen. Jeremiah Johnson and bishop Onderdonk. His greatest success, however, was in depicting humorous scenes and especially those of negro life. His "Rustic Dance," 1830, was very popular, and in 1832 he was made a member of the national academy of design. Among his pictures are "Walking the Crack," "Husking Corn," "Nooning," "Banjo Player," etc.

MOUNTAIN, The. The popular name given by the French to that part of the assembly of deputies which assumes the most radical or progressive part in legislature: and of late years more generally known as "the left"—*La gauche*. See Left. The term "mountain" was first used when the national assembly of 1789–91 moved from Versailles to Paris and occupied the riding-ball of the Louvre prepared for it. The most radical revolutionists chose the highest seats on the outside of the circle and thus acquired the title.

MOUNTAIN, GEORGE JEHOSHAPHAT, D.D., D.C.L., 1789–1863; b. England; second son of Jacob Mountain, first Anglican bishop of Quebec; graduated at Trinity college, Cambridge, in 1810. Two years later he took orders and was nominated rector of Fredericton, New Brunswick. One preferment after another rapidly followed; and in 1850 he became bishop of Quebec. He spent the greater part of his means in founding Bishops' college, in Lennoxville, P. Q. Among his published works are *Journal of a Northwest American Mission*, and *Songs of the Wilderness*.

MOUNTAIN, JACOB, D.D., 1750–1825; b. in Norfolk, England, educated at Cambridge university; took orders and held in succession the livings of St. Andrews, Buckden, and Holbeach, and was made a canon in the Lincoln cathedral. In 1793 he was nominated to the bishopric of Quebec and was the first prelate sent to the Canadas by the English church. In the establishment of mission stations and churches he was most active, and took a prominent part in the political affairs of the province.

MOUNTAIN ASH. See ROWAN.

MOUNTAIN CORK. See ASBESTUS, *ante*.

MOUNTAIN GREEN. See CHRYSOCOLLA, *ante*.

MOUNTAIN LIMESTONE, the basement rock of the carboniferous series in the s. of England and in Wales. It consists of a calcareous rock loaded with marine remains, the greater part of the rock being made up bodily of corals, crinoids, and shells. It has a variable thickness, sometimes reaching as much as 900 feet. In the n. of England and in Scotland, the marine limestones are not separated from, but alternate with the coal-bearing strata. See CARBONIFEROUS SYSTEM.

MOUNTAIN MEADOWS MASSACRE, an atrocity committed by the Indians in 1857, in Mountain meadows, Santa Clara co., Utah; as is supposed, under the instigation and direction of the Mormon leaders. A party of 120 emigrant settlers, on their way through Utah to California, had in some way aroused the suspicions of the Mormons, and at the place named were surrounded by Indians under Mormon control, and brutally massacred; only a few children of the party survived. In 1874 an investigation into the affair was ordered by the U. S. government, and John D. Lee, a Mormon bishop, and others, were indicted, tried, and condemned. Lee was executed on Mar. 22, 1877, by being shot on the very spot where the massacre took place.

MOUNTAINS. The number and the altitude of the mountains of the globe are so great that they form almost everywhere prominent objects, and operate to a large extent in modifying the climatic condition of every country in the world. Yet the amount of solid material so raised above the ordinary level of the land is not so much as might be expected. Remembering that elevated plateaus of great extent occur in several regions, and that the general surface of the earth is considerably higher than the sea level, it has been estimated that were the whole dry land reduced to a uniform level, it would form a plain having an elevation of 1800 ft. above the sea. And were these solid materials scattered over the whole surface of the globe, so as to fill up the bed of the ocean, the resulting level would be considerably below the present surface of the sea, inasmuch as the mean height of the dry land most probably does not exceed $\frac{1}{18}$th of the mean depth of the bed of the ocean.

Mountains, and especially mountain-chains, subserve important uses in the economy of nature, especially in connection with the water system of the world. They are at once the great collectors and distributors of water. In the passage of moisture-charged winds across them, the moisture is precipitated as rain or snow. When mountain-ranges intersect the course of constant winds by thus abstracting the moisture, they produce a moist country on the windward side, and a comparatively dry and arid one on the leeward. This is exemplified in the Andes, the precipitous western surface of which has a different aspect from the sloping eastern plain; and so also the greater supply of moisture on the southern sides of the Himalayas brings the snow-line 5,000 feet lower than on the northern side. Above a certain height the moisture falls as snow, and a range of snow-clad summits would form a more effectual separation between the plains on either side than would the widest ocean, were it not that transverse valleys are of frequent occurrence, which open up a pass, or way of transit, at a level below the snow-line. But even these would not prevent the range being an impassable barrier, if the temperate regions contained as lofty mountains as the tropics. Mountain-ranges, however, decrease in height from the equator to the poles in relation to the snow-line.

The numerous attempts that have been made to generalize on the distribution of mountains on the globe have hitherto been almost unsuccessful. In America the mountains take a general direction more or less parallel to the meridian, and for a distance of 8,280 miles, from Patagonia to the Arctic ocean, form a vast and precipitous range of lofty mountains, which follow the coast-line in South America, and spread somewhat out in North America, presenting everywhere throughout their course a tendency to separate into two or more parallel ridges, and giving to the whole continent the character of a precipitous and lofty western border, gradually lowering into an immense expanse of eastern lowlands. In the old world, on the other hand, there is no single well-defined continuous chain connected with the coast-line. The principal ranges are grouped together in a Y-shaped form, the general direction of which is at right angles to the new world chain. The center of the system in the Himalayas is the highest land in the hemisphere. From this, one arm radiates in a north-east direction, and terminates in the high land at Behring straits: the other two take a westerly course; the one a little to the north, through the Caucasus, Carpathians, and Alps to the Pyrenees; the other more to the south, through the immense chain of Central African mountains, and terminating at Sierra Leone. Most of the principal secondary ranges have generally a direction more or less at right angles to this great mountain tract.

The inquiry into the origin of mountains is one that has received not a little attention. Geologists have shown that the principal agents in altering the surface of the globe are denudation, which is always abrading and carrying to a lower level the exposed surfaces, and an internal force which is raising or depressing the existing strata, or bringing unstratified rocks to the surface. Whether the changes are the small and almost imperceptible alterations now taking place, or those recorded in the mighty mountains and deep valleys everywhere existing, denudation and internal force are the great producing causes. These give us two great classes of mountains.

1. *Mountains produced by denudation.*—The extent to which denudation has altered the surface of the globe can scarcely be imagined. All the stratified rocks are produced by its action; but these do not measure its full amount, for many of these beds have been deposited and denuded, not once or twice, but repeatedly before they reached their present state. Masses of rock more indurated, or better defended from the wasting currents than those around, serve as indices of the extent of denudation. The most remarkable case of this kind with which we are acquainted, is that of the three insulated mountains in Ross-shire—Suil Veinn, Coul Beg, and Coul More—which are about 3,000 ft. high. The strata of the mountains are horizontal like the courses of masonry in a pyramid, and their deep red color is in striking contrast with the cold bluish hue of the gneiss which forms the plain, and on whose upturned edges the mountain-beds rest. It seems very probable, as Hugh Miller suggests, that when the formation of which these are relics (at one time considered as old red sandstone, but now determined by sir Roderick Murchison as being older than Silurian), was first raised above the waves, it covered, with an amazing thickness, the whole surface of the highlands of Scotland, from Ben Lomond to the Maiden Paps of Caithness, but that subsequent denudation swept it all away, except in circumscribed districts and in detached localities like these pyramidal hills.

2. *Mountains produced by internal force.*—These are of several kinds. (*a.*) Mountains of ejection, in which the internal force is confined to a point, so to speak, having the means of exhausting itself through an opening in the surface. The lava, scoriæ, and stones ejected at this opening form a conical projection which, at least on the surface, is composed of strata sloping away from the crater. Volcanoes are mostly isolated conical hills, yet they chiefly occur in a somewhat tortuous linear series, on the mainland and islands which inclose the great Pacific ocean. Vesuvius and the other European volcanoes are unconnected with this immense volcanic tract. (*b.*) But the internal force may be diffused under a large tract or zone, which, if it obtain no relief from an opening, will be elevated in the mass. When the upheaval occurs to any extent, the strata are subjected to great tension. If they can bear it, a soft rounded mountain-chain is the result; but generally one or more series of cracks are formed, and into them igneous rocks are pushed, which, rising up into mountain-chains, elevate the stratified rocks on their flanks, and perhaps as parallel ridges. Thus, the Andes consist of the stratified rocks of various ages, lying in order on the granite and porphyry of which the mass of the range is composed. The position of the strata on such mountains supplies the means of determining, within definite limits, the period of upheaval. The newest strata that have been elevated on the sides of the mountain when it was formed, give a date antecedent to that at which the elevation took place, while the horizontal strata at the base of the mountain supply one subsequent to that event. Thus, the principal chain of the Alps was raised during the period between the deposition of the tertiary and that of the older recent deposits. (*c.*) But there is yet another way in which the upheaving internal force operates, viz., where it does not act at right angles to the surface, but rather obliquely, and, as it were, pushes the solid strata forwards, causing them to rise in huge folds, which, becoming permanent, form parallel ranges of mountains. The crust of the earth, in its present solid and brittle condition, is thus curved, in a greater or less degree, by the shock of every earthquake; it is well known that the trembling of the earth is produced by the progress of a wave of the solid crust; that the destruction of buildings is caused by the undulation; and that the wave has been so evident, that it has been described as producing a sickening feeling on the observer, as if the land were but thin ice heaving over water. This mode of mountain formation has been explained when treating of the Appalachians (q.v.), which were thus formed. Many other ranges have had a similar origin, as some in Belgium and in the southern Highlands of Scotland, as has been suggested by Mr. Carruthers.

It is evident that in the last two classes the parallel ridges were produced at the same time. Elie de Beaumont generalized this, maintaining that all parallel ridges or fissures are synchronous; and on this he based a system of mountain-structure, which is too universal and too geometrical to be true. The synchronism of parallel fissures had been noticed by Werner, and it is now received as a first principle in mining. The converse is also held to be generally true, that fissures differing in direction differ also in age: yet divergence from a center, and consequent want of parallelism, as in the case of volcanoes, may be an essential characteristic of contemporaneity. Nevertheless, Elie de Beaumont classified the mountains of the world according to this parallelism, holding that the various groups are synchronous. The parallelism does not consist in having the same relations to the points of the compass—for these, as regards n. and s., would be far from parallel—but is estimated in its relation to some imaginary great circle, which being drawn round the globe would divide it into equal hemispheres. Such circles he called great circles of reference. But beyond this, he went a step further, and proposed a more refined classification, depending on a principle of geometrical symmetry, which he believed he had discovered among his great circles of reference. It is to be feared, however, that his geometrical speculations have little foundation in nature.

MOUNTAINS OF THE MOON, the name of a supposed range of mountains running across central Africa, from the Atlantic to the Indian ocean. The Nile was supposed by the ancient geographers to rise in them. Modern explorations have disproved the existence of any such range. Speke, in 1858, gave the name to the mountains n. of lake Tanganyika.

MOUNT AUBURN. See CAMBRIDGE, MASS.

MOUNT DESERT, an island in Maine, having Frenchman's bay and five rocky islands called the Porcupines on the e.; Mount Desert rock 20 m. s. in the open sea; and Soame's sound flowing up into its s. portion for about six m.; the island being 12 m. in width and 15 m. long; pop. '80, 1017. It is included in Hancock co., and comprises the towns of Eden, Mount Desert, and Tremont, with 11 post-offices; among them, Soamesville, Seal Cove, and East Eden. The Mount Desert post-office is at Soamesville. The island is one m. from the main land, and has 8 convenient harbors, Bar Harbor, North-east, and South-west. Great Head and Schooner Head are tall cliffs on the s.e. coast. It is crossed by 7 ridges of hills, the highest peak, mount Adam or mount Green, rising to an altitude of 1762 ft. above the level of the sea; and among the mountains are beautiful lakes of considerable size. It is celebrated for the grandeur and beauty of its scenery, and is much frequented as a summer resort. It is 80 m. s.e of Bangor and was first discovered by the French in 1608, who named it St. Sauveur, but the settlement was destroyed in 1613 by an expedition commanded by Samuel Argall, of Virginia, under the governorship of sir Thomas Dale. The first house of the future permanent settlement was built by Abraham Soames, in the center of the island, overlooking the head of the sound, in 1761. It has excellent public schools, 6 churches, and about 20 hotels. It has a prosperous community engaged in cod and mackerel fishing, the manufacture of lumber, and ship-building. A feature of peculiar attractiveness as compared with many sea-shore resorts is the combination of mountain and marine scenery.

MOUNTFORD, WILLIAM, b. England, 1816; educated at Manchester college, York; became a Unitarian minister, and was pastor of a church in Manchester from 1838-41. In 1846 he published a book entitled *Martyria*, and in 1850, *Euthanasia*, works which gave him some reputation. During 1850 he also visited the United States, and accepted the pastorate of a Unitarian church in Gloucester, Mass. He soon after retired, however, from the ministry, and has since resided at Cambridge, Mass.

MOUNT HOLLY, the seat of justice of Burlington co., N. J., on a branch of the Rancocas creek, which empties into the Delaware river; terminus of two branches of the Pennsylvania railroad, affording two ways of transit to New York city, and one way to Philadelphia; 18 m. s. of Trenton; pop. 5,500. The town is, by artificial means, furnished with gas and water, the latter from a hill 200 ft. high, from which the place takes its name. There are numerous machine shops, foundries, saw-mills, and factories. It has a jail, county buildings, 8 churches, fine schools, two newspapers, and a children's home.

MOUNT HOLYOKE FEMALE SEMINARY, at South Hadley, Mass., two m. e. of the Connecticut river, and 4 m. s. of the mountain from which it takes its name. Its founder was Miss Mary Lyon, a lady who combined, in an unusual degree, physical, intellectual, and moral strength. During ten years of successful teaching in a private school, her attention was awakened to the importance of establishing a permanent institution for the education of young women, where the expenses should be very moderate and the advantages very great. The problem was difficult. At that time many people thought that for the higher education of girls little more was needed than a superficial acquaintance with a few ornamental branches. There were private schools that promised this for the daughters of the rich, and district schools sufficed for the rest. Why should colleges be established with faculties, buildings, libraries, cabinets, and apparatus, merely to educate girls? For a long time the public could not be aroused to the importance of the subject. The rich were even more indifferent than the middle classes. But as Miss Lyon thought on the enterprise she became thoroughly absorbed in it, and was willing to spend her life in poverty and toil for its sake. In 1834 she devoted herself to the task. Little by little funds were collected for the first building. Its corner-stone was laid in October, 1836, and the school opened November, 1837. Its principal objects were: 1. To provide for young women with limited pecuniary resources a thorough practical education. 2. To supply, not a preparatory school for younger pupils, but a college for those of maturer years, admitting none under 16 years of age. 3. To educate superior teachers. 4. To arrange the institution so that the pupils should do the household work themselves, partly in order to reduce expense, but chiefly to teach the dignity of such work and to promote health, cheerfulness, independence, and symmetry of character. These objects have been kept steadily in view, and with great and increasing success through more than 40 years. The prescribed course of study embraced three years, until 1862, when a fourth year was added. There are also optional courses in Greek, German, and French, extending through the four years, which may be pursued in addition to the prescribed studies, but not as substitutes for them. In planning the course the friends of the institution were aware that many pupils would be able to pursue only a part of it. Yet to spend two years, or even one year, in thorough study is a great advantage to those whose means or opportunities allow them no more. Of late years an increased proportion of those who enter complete the course. The graduates, including the class of '80, number over 1700. Fully three-fourths of the whole number of pupils have engaged in teaching, some as a profession for life, and the rest for transient periods. The terms for board, tuition, and incidentals, have always been as low as would suffice to cover the ordinary running expenses. At present the sum of $175 per annum includes all charges. The buildings, grounds, library, and apparatus have been furnished chiefly by private benefactions; with the addition of $40,000 granted by the legislature of Massachusetts in 1868, after a careful inquiry into the usefulness of the seminary during the 30 years of its existence. The annual income from payments for board and tuition is about $45,000, in addition to which a small amount is received from invested funds given for specific objects connected with the welfare of the institution. The grounds comprise twenty-one acres of picturesque scenery in which nature has, to some extent, anticipated the work of the landscape gardener. The buildings are: the original main edifice, (enlarged) four stories high, with wings at each end; the gymnasium, forming with the others a quadrangle; the library, a fire-proof edifice, well arranged and handsomely finished; the Lyman Williston hall, containing well appointed lecture and recitation rooms, a chemical laboratory, cabinets of mineralogy, botany, zoology and geology, and an art gallery, enriched with some superior original paintings by celebrated American artists, and some fine copies of works by old masters; and a temporary observatory, furnished with a good telescope. The library contains 10,500 volumes of very carefully selected works, in English literature, in the French, German, Latin, and Greek languages, and in science and art. The instruction is given by the principal, two associate principals, and twenty-five teachers (all ladies) and by seven gentlemen (distinguished professors in other institutions) who deliver annual courses of lectures in their respective departments. The present number of students (1880) is 226, and the total number of graduates 1704.

MOUNTMEL'LICK, a market-town and seat of poor-law union, in Queen's co., province of Leinster, Ireland. It is situated on the river Owenass, a branch of the Barrow, 47 m. directly w.s.w. from Dublin. The pop. in 1871 was 3,315. The t. has long been a chief seat of the Society of Friends, who established a manufactory of coarse woolen friezes and tweeds, by which many poor children are employed. Mountmellick was also the seat of other manufactories, especially a foundry, a machine-factory, and a beet-root sugar factory, the results of which, however, were disappointing.

MOUNT PLEASANT, seat of justice of Henry co., Iowa, on a branch of the Skunk river, which flows into the Mississippi; on the Chicago, Burlington, and Quincy railroad, 28 m. w.n.w. of Burlington; pop. 4,563. The town contains the state hospital for the insane, the Iowa Wesleyan university, organized in 1855, to which both sexes are admitted, a female seminary, 14 churches, graded public schools, 2 national banks, 2 newspapers, gas-works, sash and blind and wagon factories, and a tannery.

MOUNTRAILLE, co. Dakota; See MONTRAILLE.

MOUNT SAINT ELIAS. See ALASKA.

MOUNT VERNON, a t. in s.w. Indiana, on the n. bank of the Ohio river, and on the St. Louis and Southeastern railroad; pop. '70, 2,880. It is the co. seat of Posey co., and a place of considerable trade and river commerce. It is 33 m. w. of Evansville, and 142 m. s.e. of St. Louis. It is delightfully located on table land, commanding an unobstructed view of the river for miles, and has 9 churches, 2 banks (one of them national), 3 weekly newspapers, a court-house, and planing, flour, and saw mills.

MOUNT VERNON, a village in s.e. New York, on the New York, New Haven and Hartford, and the New York and Harlem railroads; pop. '70, 2,700. It is in the township of East Chester in Westchester co., and is pleasantly situated on the Bronx river, 15 m. from New York, equidistant from the Hudson river on the w. and Long Island sound on the east. It contains 8 churches, excellent public schools, 2 banks, 3 weekly newspapers, a well-organized fire department, and 4 hotels. The leading industries are the manufacture of pens, horn and rubber jewelry, glue, and carriages.

MOUNT VERNON, a city in Knox co., c. Ohio, a junction of the Cleveland, Mt. Vernon, and Delaware railroad, and the Baltimore and Ohio; pop. '70, 4,876. It is 45 m. n.e. of Columbus, and 25 m. n.w. of Newark. It was set off in 1805, and is delightfully located on the sloping bank of the Vernon river to the n. of the stream. The river furnishes extensive water-power, utilized by flour and saw mills, the manufacture of woolen goods, flax, twine, etc. In the city are the railroad repair shops, and manufactories of machinery, steam engines and boilers, furniture, leather, linseed oil, sashes and doors. It is the center of a considerable trade from the fertile agricultural region in its vicinity. It is lighted with gas, and has 12 churches, excellent public schools, an elegant court-house, a variety of stores, 3 banks (2 of them national), 2 newspapers, and many elegant private residences.

MOUNT VER'NON, the seat and tomb of George Washington, first president of the United States of America, on the right bank of the river Potomac, in Virginia, 15 m. below Washington. The residence of Washington, finely situated on the rising bank of the river, and his tomb, with an estate of 200 acres, have been purchased by a patriotic society of ladies, to be kept as a place of public resort, and a memorial of the "Father of his country."

MOUNT VERNON (*ante*), the home of George Washington, in Fairfax co., Virginia, on the right bank of the Potomac, 17 m. s. of Washington. The Washington mansion is of wood, 2 stories high, 96 ft. long, and 30 ft. deep. It was built in 1743, by Washington's elder brother, Lawrence, who called it Mount Vernon, after admiral Vernon, under whom he had served in the British navy. It is on a wooded hill from which there is a beautiful view of the Potomac, down to which a lawn of 5 or 6 acres slopes. A high piazza runs along the front of the house, which has 6 rooms of moderate size on the ground floor. They contain many objects of historical interest. The library was designed by Washington himself, but at present contains little of the original furniture. Most of Washington's books are in the possession of the Boston Athenæum. The tomb of Washington is a few hundred yards from the house, near a wooded ravine. The body of Washington was removed thither from the old family vault in 1831. An effort was made in 1832 to secure the removal of the body to the crypt of the capitol at Washington, but the representatives of the family refused. Mount Vernon, which had been much enlarged by Washington, was by him bequeathed to Bushrod Washington, upon whose death it came into the hands of his nephew, John A. Washington, who sold it in 1858 to the Ladies' Mount Vernon association for $200,000, of which $68,494.59 was the contribution of Edward Everett. The association hold the place in trust, as a place of public interest; and upon the dissolution of the association, or its failure to perform the objects for which it was formed, Mount Vernon will revert to the state of Virginia.

MOURNE MOUNTAINS. See DOWN, COUNTY OF.

MOURNING, a particular habit worn to express grief, especially for the decease of friends. The usages regarding mourning have varied much at different times and in different countries. Among the Jews, the duration of mourning for the dead was generally 7, but sometimes protracted to 30 days: and the external indications of sorrow consisted in weeping, tearing the clothes, smiting the breast, cutting off the hair and beard, lying on the ground, walking barefoot, and abstaining from washing and anointing themselves. Among the Greeks, the period was 30 days, except in Sparta, where it was limited to 10. The relatives of the deceased secluded themselves from the public eye, wore a coarse black dress, and in ancient times cut off their hair as a sign of grief. Among the Romans, the color of mourning for both sexes was black or dark-blue under the republic. Under the empire, the women wore white, black continuing to be the color for men, who did not cut off the hair or beard as in Greece. Men wore their mourning only a few days; women a year, when for a husband or parent. The time of mourning was often shortened by a victory or other happy public event, the birth of a child, or the occurrence of a family festival. A public calamity, such as a defeat, or the death of an emperor or person of note, occasioned a public mourning, which involved a total cessation of business, called Justitium. In modern Europe, the ordinary color for mourning is black; in Turkey, violet; in China, white; in Egypt, yellow; in Ethiopia, brown. It was white in Spain until 1498. Mourning is worn of different depth, and for different periods of time, according to the nearness of relationship of the deceased. On the death of a sovereign or member of the reigning house, a court mourning is ordered; and in this country, it is usual at the same time to recommend the adoption of a general mourning.

In Scotch law, if a husband die, whether solvent or insolvent, the widow will be entitled to a preferable payment out of the assets for mournings suitable to his rank. And the same privilege applies to mournings for such of the children as are to assist at the funeral. In England, there is no such privilege or distinction.

MOU'SA, an island of Shetland, remarkable for an object of antiquity styled Burgh-*Mousa*, which consists of a round tower of the class known in the north of Scotland as Pictish towers. Burgh-Mousa occupies a knoll close upon the rocky sea-beach, from which materials for its construction had been taken. The whole fabric is composed of flat slabs of clay-slate, which have been easily piled together in a compact mass without the aid of mortar. In exterior figure, the tower is round, inclining inward about half-way up, and then bulging out near the top. Near the foundation its circumference is 158 ft., and it measures about 40 ft. in height. On the side next the sea, there is a doorway, and that is the only exterior aperture. If there were ever any door-posts, they have disappeared; it is feasibly conjectured, however, that instead of employing a door, the inmates had, on emergencies, built up the opening, for which there is an abundance of loose materials at hand. Entering the doorway, we find the wall 16 ft. thick, and looking upward, feel as if we were at the bottom of a well, for the circular interior has no flooring, and the top is open to the sky. Opposite the doorway, there is an entrance to a passage and stair which wind upward, within the thickness of the wall, to the summit of the building. At different places there are recesses, or galleries, leading off from the stair, lighted by apertures to the interior; such dismal holes being all that we find in the way of apartments. It is customary to speak of an outer and inner wall; but the two walls, if we so distinguish them, are so firmly bound together by the stair and otherwise, as to afford a united resistance to assault. Obviously, the structure was used as a retreat in case of attack from foreign enemies, against whom missiles could be showered down from the species of battlement formed by the top of the well-knit walls. According to tradition, the tower of Mousa was occupied by Erland, a Norwegian jarl, about 1154, when it successfully endured a siege that was undertaken to recover a runaway lady; but how any lady could have found accommodation in such miserable quarters, it is difficult to conjecture. The Society of Scottish antiquaries deserves thanks for having repaired this fine memorial of a former state of society in Shetland. From its comparatively complete state, Burgh-Mousa is considered a good specimen of the Pictish towers, so called.

MOUSE, *Mus*, a genus of rodent mammalia of the family *Muridæ* (q.v.), having three simple molar teeth in each jaw, with tuberculated summits, the upper incisors wedge-shaped, the lower compressed and pointed, the forefeet with 4 toes and a rudimentary thumb, the hind feet five-toed; the tail long, nearly destitute of hair, and scaly. This genus includes rats (q.v.) and mice; the smaller species bearing the latter name.—The COMMON MOUSE (*M. musculus*) is perhaps not originally British, although now so abundant everywhere. It accompanies man wherever he goes, and readily colonizes every region, arctic, temperate, or tropical; its great fecundity, common also to most of its congeners, causing means to be employed everywhere for the prevention of its excessive multiplication. Aristotle made the experiment of placing a pregnant female mouse in a closed vessel filled with grain, and found in a short time no fewer than 120 mice in the vessel. Of cats and mouse-traps it seems unnecessary here to speak, and equally unnecessary to give a description of the common mouse. There are several varieties of this species. That generally found in houses is smaller, and not so dark in color, as that common in barns and farm-yards. A white variety sometime occurs, and has been perpetuated in a half-domesticated state. The common brown kind is, however, at least as easily tamed, and readily becomes familiar enough. A pied variety is not uncommon in India.—Much has been written about the singing powers of the mouse; it being asserted, on the one hand, that mice not unfrequently show a strong love for music, and a power of imitating the song of birds; whilst, on the other hand, it is alleged that the singing of mice is merely the consequence of throat disease.—The mouse makes a nest like that of a bird in the wainscot of a wall, among the chaff or feathers of a bed, or in any similar situation. The litter is generally from 6 to 10 in number.—The WOOD MOUSE, or LONG-TAILED FIELD MOUSE (*M. sylvaticus*), is a little larger than the common mouse. Its tail is longer; its ears are also longer; its muzzle rather longer; its under parts lighter in color than in the common mouse. It is abundant throughout Britain and the temperate parts of Europe, and is a grievous pest in gardens and fields. It lays up stores of grain and other food, either in thick tufts of grass, or just under the surface of the earth. The quantity of food laid up in such stores is often wonderfully large. The field mouse is timid, gentle, and easily tamed.—The smallest British mouse, and the smallest British quadruped, is the HARVEST MOUSE (*M. messorius*), of which the head and body are only 2¼ in. in length, the tail being almost equally long, and to some degree prehensile; the general form elongated and slender, the head narrow, the ears not large. This species is not uncommon in some parts of the south of England; it is also found in the south of Scotland, although less frequently. It makes its nest among the stalks of wheat, reeds, or other grasses, weaving together the leaves and panicles of grasses, the leaves being for this purpose cut into shreds by its teeth. The nest is a very curious structure formed by mere intertwining, without cement of any kind. It is generally suspended among the stalks. It is globular, or nearly so, and entrance to it is through an opening, which almost completely closes up again.—A still smaller species of mouse (*M. pumilus*) is found in the south of Europe.—An American species, the WHITE-FOOTED MOUSE (*M. leucopus*), common in most parts of North America, and intermediate in its habits between the common mouse and the field mouse, is said to depart from houses whenever either the cat or the brown rat appears in them.—The Barbary mouse (*M. Barbarus*) approaches in size to the rats, and is distinguished by its longitudinally striped fur.

The name mouse is often popularly given to animals considerably different from the true mice, as the *voles* (q.v.).

MOUSE-EAR CHICKWEED, *Cerastium*, a genus of plants of the natural order *caryophyllaceæ*, having 5 sepals, 5 bifid petals, 10 stamens, 5 styles, and a capsule bursting at the top with 10 teeth. The species are numerous, natives of temperate and cold countries in all parts of the world. Some of them are among the most common weeds in Britain; others, having larger flowers, are occasionally planted in flower-borders and on rock-works. The form and hairiness of the leaves of some of the British species have given rise to the popular name.

MOUSSELINE. See Muslin, *ante*.

MOUTH, Diseases of the, occur in different forms, but usually begin with inflammation of the mucous membrane. The inflammation may be equally diffused, or may be chiefly or entirely confined to the mucous follicles. When diffused, it may either present no peculiar secreted product, or the surface may be covered with a curd-like secretion, or with patches of false membrane. It may further be attended with eruption, ulceration, or gangrene, any one of which may impress a special character on the disease, or it may present peculiarities from the nature of its exciting cause, as when it accompanies scurvy, or is the result of mercurial action.

The following are the principal forms of inflammation of the mouth, or *stomatitis* (Gr. *stoma*, the mouth), as it is termed by nosologists. 1. *Common diffused inflammation*, which appears in reddened, somewhat elevated patches, and sometimes occupies large portions of the surface of the mouth. It is more commonly a complication of other diseases than an original affection. When of the latter character, it is generally caused by the direct action of irritants, as by scalding drinks, corrosive substances introduced into the mouth, accumulated tartar on the necks of the teeth, etc. In ordinary cases cooling and demulcent liquids (such as cream or almond oil) applied locally, an occasional saline cathartic, with a soft and chiefly farinaceous diet, constitute the whole of the necessary treatment.

2. *Diffused inflammation, with curd-like exudation*, is almost entirely confined to infants, and is described under its popular name of Thrush.

3. *Inflammation of the follicles*, and *eruption or vesicular inflammation*, are described in the article apthæ (q.v.).

4. In *ulcerative inflammation*, *cancrum oris*, or *canker*, an ulceration often of considerable size, with a grayish surface and an inflamed edge, appears on the gums, or inside of the cheeks or lips. The swelling of the adjacent parts is often so considerable as to be apparent externally. There is a copious flow of saliva, and the breath is very offensive. The disease generally occurs in children from 2 to 6 years of age. The ulcer may continue for weeks, or even months, but always yields to treatment. The febrile symptoms and the constipation which are usually present must be combated in the ordinary way. Perhaps the best general method of treating the disease is by the administration of chlorate of potash (4 or 5 grains in sweetened water every 4 hours), and by frequently washing the mouth with a weak tepid solution of chlorinated soda.

5. The preceding affection is sometimes the first stage of a much more serious affection, viz., *gangrene of the mouth*, which usually occurs in children between the first and second dentition. A sloughing ulcer forms upon the gums, or some other part of the mouth. This slough spreads, the breath becomes extremely fetid, the disease extends to the alveolar processes, and the teeth are loosened and fall out. Inability to take food is followed by exhausting diarrhœa, and death is the usual termination. Unless taken in the early stage, when tonics and the local application of caustics may be serviceable, the disease is generally fatal.

Other affections of the mouth are noticed in the articles Salivation and Scurvy.

MOVABLE FEASTS. See Easter; Festivals, *ante*.

MOVABLES, in Scotch law, is the technical term to denote personal as contradistinguished from heritable property, one of the main distinctions of property being between these two classes. Heritage goes to the heir-at-law in case of intestacy, or what is equivalent to it, and movables go to the next of kin. See Kin. The term movables is thus not confined to corporeal things, as furniture, cattle, goods, etc., but includes debts, bills of exchange, rights of action, etc.

MOVEMENT CURE, a hygienic and therapeutic system for the preservation as well as the recovery of health, introduced by Peter Henry Ling, a native of Smaland, in Sweden, b. 1766. It is a modified form of gymnastics, and being systematized and specially adapted to the treatment of invalids in a reduced condition, possesses, in many respects, additional advantages to those afforded by ordinary gymnastics. The ancient Greeks and Romans, particularly the former, brought the science of gymnastics, in its purely hygienic relations and as adapted to the development of great strength and agility in healthy constitutions, to a great degree of perfection, as is attested by the power they possessed of performing wonderful feats of strength, endurance, and agility. But their Spartan-like processes would, if practiced upon invalids, particularly of the modern type, promote death rather than recovery. It is probable that the ordinary bodily exertions practiced by a normally educated man employed in active business pursuits are, in general terms, sufficient aids to the stimulation of the other functions of the body; but it must be confessed that normally developed and healthy men are exceptional. Civilization, with its competitions, strifes, and various requirements, has imposed restraints which interfere with and prevent normal development. The practice of ordinary gymnastics, or of the ordinary recreations, such as walking, rowing, boxing, horseback riding, etc., would probably be sufficient for the restoration of functional equilibrium in a person simply jaded by over-work, and this method, because it employs unconscious exertion and perfect relaxation of mind, or essays to do so, is preferable; but, at the same time, it must be acknowledged that in very many cases an individual has formed habits of movement which are more or less abnormal. Many of his muscles, and groups of muscles, from habits formed in the prosecution of his business, have had but very little exercise; they are consequently sluggishly nourished, and do not eliminate effete matter in a manner suited to the requirements of the nerves which enter them, or of the general nervous system with which they are connected. Under such circumstances exercise requires to be systematized more than it is in the rapid and successive movements which take place in ordinary exercise or labor. The man is like a machine out of order: the mere setting in motion of which, if its parts are not completely deranged, will not produce repair. In some instances a patient who might be benefited by partial exercise, would be injured by bringing into action the whole body. These premises being admitted, it will be seen that what is called movement cure can, in many cases where ordinarily healthy persons are undergoing training, be advantageously conjoined with ordinary gymnastics. Ling started a genuine reformation; and he had the approbation of his sovereign in his efforts—a royal ordinance for the establishment of an institution being issued in 1814, and the Swedish government to-day acknowledges the advantages it derives from a governmental institution and from other private establishments of the kind. The natural exercise which is obtained by walking or riding, or moderate gymnastics, ought not to be too readily laid aside for problematic advantages of exercising distinct groups of muscles, unless such a course is very clearly indicated; but, at the same time, it must be borne in mind that many persons have been injured by over-exertion at the gymnasium. Although, as a general rule, unconscious exercise, such as is taken in genuine recreations, is preferable to that which is forced, it is claimed by those who have practiced the movement cure that there are cases in which conscious and directed movements are more beneficial than those which are unconscious; and this is not an unreasonable conclusion, if such movements are performed so as to render the exercise a diversion. One of the principles of the movement cure is that a muscle or a group of muscles shall not be exercised continuously for a long time, but that there shall be an interval or intervals of rest, during which assimilative nutrition takes place better than when the action is prolonged. Blood is drawn to the part, and during the succeeding resting spell the muscles grow, instead of wasting by continued exertion. Those who have an unbalanced muscular development, no doubt, in walking and riding, often over-work the weaker muscles, from the effects of which they afterward suffer discomfort, and miss the securing of the desired harmonious results. When, therefore, it is sought to restore weakened or disused muscles, great care ought to be taken not to overtax them, but to stop short of fatigue; but this is often incompatible with the taking of a walk or a ride of much length. The more correct physiological plan is, in certain cases, to let the general muscular system remain comparatively quiet, while intermittent and moderate movements are made with the special muscles under treatment. This will tend, after a while, to bring them up to a standard sufficient to enable them to take a fair share with the stronger muscles in the general movement of the body, so that by using the latter rather below their capabilities, and the former just enough for theirs, an equilibrium will at last be brought about. To secure this result various devices are practiced, one of the chief principles being that the patient may teach himself, or be taught, how to exercise particular muscles, or sets of muscles, without the aid of any apparatus, but while he is in a natural standing, sitting, or recumbent position. The muscles of the thighs, or of the legs, may be brought into action—and into strong action if it should be desirable—by an effort of the will, and that with scarcely any alteration in the posture. The gluteal muscles are readily brought into action during any position of the body. While lying upon the back, or upon the side, they are readily contracted, and may be held in such a state for any desirable length of time, and at any moment allowed a period of repose for the natural operation of assimilation. This is certainly philosophical practice, and that good results will follow it cannot be denied. The abdominal muscles can very advantageously be set in motion while one is lying upon the back by raising the head from the pillow, and repeating the operation as often as may be thought beneficial. But this exercise is not confined to the abdominal muscles, the pectoral muscles take a certain share, and also the diaphragm; but one peculiar benefit is derived from the stimulus given by the contracted abdomen walls to the involuntary muscles of the alimentary canal, which are usually, in cases calling for this mode of treatment, in a weakened and more or less torpid condition. It is frequently asked why physicians do not more often recommend such practice to their patients. A great part of a physician's duty lies in the treatment of acute diseases, which, as a rule, are not susceptible of cure by movements of the muscular system, and will not, in most cases, admit of such practice without hurtful results. When the body is poisoned by disease germs, as in many of the contagious fevers, there is an unnatural performance of functions which is incompatible with much voluntary motion. Sometimes, indeed, passive motion may be made with benefit, such as gently kneading the bowels, but, as a rule, rest, often absolute rest, is required; and, as the conditions of the disease usually involve the loss of some of the mineral constituents of the body, medicines judiciously administered are of great importance. There is no doubt of the efficacy of quinine in the treatment of that poisoned condition engendered by miasm, nor of the beneficial effects attending the use of alkaline medicines in many febrile and inflammatory conditions. Many patients would die of gout and rheumatism but for the action of alkalies, and the almost sovereign power, in many cases of gout, of the plant called colchicum. There are conditions of the system in robust as well as delicate persons, when attacked by acute disease, in which the relief afforded by morphine, or some constituent of opium, would appear to be the only means of saving life. The principal occupation, therefore, of the general practitioner is in prescribing the ordinary therapeutic remedies and attending to those directions which concern the immediate necessities of the patient, such as diet, ventilation of the sick-room, rest and quiet; and there is a temptation to fall into routine habits, but this temptation is not as often yielded to as is supposed, or alleged. Indeed, it is a matter well understood among medical practitioners that, as a rule, it is impossible to prevail upon patients to follow hygienic prescriptions. They are told to ride on horse-back, to walk, to use dumb-bells and Indian-clubs, to go to the gymnasium, or to the movement cure; but they do not obey directions; they have no time. The merchant must attend to his business; his presence is needed on change, and not at the gymnasium, or at the movement cure, or anywhere, dressed in the attire of an athlete, or of an invalid. A lady has a multitude of domestic duties, or, if they are neglected, it is for society and its gayeties, or for pressing demands made upon her for benevolent or charitable work, or for the necessary attentions due to her neighbors and friends. A thousand counter-attractions cause the doctor's injunctions to be disregarded; and is it any wonder that his youthful enthusiasm becomes somewhat modified, and that, after a while, he submits to the necessity of employing such means only as he can carry out to the best advantage? The practice of movement cure is, however, attended with difficulties. There will be an unavoidable tendency to carry speculations and theories to an unwarrantable extent, and to give an indefinite multiplication of movements under an exaggerated idea of their importance, which often results in a want of confidence on the part of the patient in well-established but older methods, and leads him to neglect timely consultation with the general practitioner, or surgeon, in cases requiring active medical or operative surgical interference. On the other hand, there is probably not enough attention paid by many of the medical profession to movement methods of cure in cases of deformities, particularly to those of the spinal column. It would be unjust, however, to infer that such neglect is very prevalent. There are a great many surgeons, who, without calling public attention to their methods of treating deformities, are in the constant practice of deriving aid from muscular and passive movements of all kinds applicable to each particular case. Indeed, such practice furnishes the basis for the brilliant results which attend the practice of modern surgery, many of which are detailed in the history of cases published in numerous medical journals for the special benefit of the profession, and which are seldom seen by the public.

MOVERS, Franz Karl, 1806–56; b. Westphalia; received his theological education at Münster, where he also pursued the study of the Semitic languages. After being settled for six years over a church in Berkum, he was appointed professor of theology in the university of Breslau, where he remained till his death. His exhaustive work on the Phenicians, *Die Phönizier*, appeared in 4 vols. between 1840 and 1856, and is the standard authority upon its subject.

MOVILLE', a small market t. of Ireland, in the county of Donegal, on lough Foyle. 18 m. n.n.e. of Londonderry. It is a calling-station of the transatlantic steam-packets of the Anchor and Allan lines. Pop. '71, 1208.

MOVING PLANT, *Desmodium gyrans*, a plant of the natural order *leguminosæ*, sub-order *papilionaceæ*, a native of India, remarkable, as are also some other species of the same genus, for the spontaneous motion of the leaves. The leaves are ternate, the lateral leaflets much smaller than the terminal one. These lateral leaflets are in constant motion, being elevated by a succession of little jerks till they meet above the terminal leaflet, and then moving downwards by similar rapid jerks to the leaf-stalk. Sometimes one leaflet is in motion and the other at rest. Sometimes a few may be seen moving, whilst there is a partial cessation in the other leaves of the plant. A high wind causes this cessation more than anything else; the movements are more languid in a very hot dry day, and are to be seen in their perfection in warm moist weather. The terminal leaflet does not remain absolutely at rest, although its movements are not like those of the lateral ones, but oscillates slowly from one side to the other. Concerning these remarkable movements, nothing more than the fact that they take place can yet be said to be known.

MOWATT, Anna Cora. See Ritchie.

MOWER, a co. in s.e. Minnesota, adjoining Iowa; drained by the Red Cedar, Upper Iowa, and Root rivers; traversed by the Southern Minnesota and Milwaukee and St. Paul railroads; 720 sq.m.; pop. '80, 16,799—11,864 of American birth. The surface is mostly prairie land, and wheat is produced in large quantities. Co. seat, Austin.

MOWER, Joseph A., 1830–70; b. Vt.; received a common education, and learned the trade of a carpenter. He entered the Mexican war as a private in a corps of engineers, and was commissioned as lieut. of 1st infantry in 1857; appointed capt. in 1861.

He fought in the early battles of the rebellion in Kentucky and Tennessee; received his appointment as col. of 11th Missouri vols. in May, 1862; was conspicuous in the capture of Island No. 10; severely wounded at the battle of Corinth, Oct. 4, and for a time in the hands of the enemy; promoted to be brig.gen. in Nov., 1862, and commanded a brigade at Vicksburg, where he displayed great bravery. He rose to the rank of maj.gen. in 1864, and commanded a division in Louisiana under gen. Banks; was called to assist Sherman in the Atlanta campaign, and, at the close of the war, was in command of the 20th corps. In 1866 he was appointed col. of 25th infantry, and placed in command in Louisiana, where he remained until his death in New Orleans.

MOWING AND REAPING MACHINES. See REAPING, *ante.*

MOX'A is a peculiar form of counter-irritation which was early practiced in the east, particularly by the Chinese and Japanese, from whom it was learned by the Portuguese. One or more small cones, formed of the downy covering of the leaves of *artemisia moxa* (as used by the Chinese), or of the pith of various plants (as of the common sunflower), or of linen steeped in niter, are placed on the skin over the affected part, and the ends remote from the skin are ignited. The combustion gradually proceeds through the cone and forms a superficial eschar on the skin. The surrounding parts must be protected by a pad of wet rag, with a hole in it for the moxa.

It may be employed with advantage in certain forms of neuralgia (especially obstinate sciatica) and in paralysis, and in chronic diseases of the joints. It is not much used in consequence of its apparent severity, but the pain is not so great as might be expected, and, according to some of its advocates, is less than often attends blisters.

MOXOS, or MOJOS, a nation of Indians in eastern Bolivia; civilized by the missionary fathers, but now much reduced in numbers and property. They have strong features, intelligent faces, and an independent manner; honest and religious; boatmen on the Mamore, the Madeira, and even to the Amazon. Their language was in contact with the Quichua and Aymara, both of which it resembles. Their early customs show a trace of Guarani influence, and it is probable that they were the farthest tribe in this direction under the control of the Incas.

MOYLAN, STEPHEN, 1734–1811; b. Ireland; emigrated to Philadelphia. Soon after the outbreak of the revolutionary war he went to Cambridge, Mass., where the American camp then was, and was selected by Washington as one of his aids-de-camp. He shortly resigned this office and entered the army as a volunteer. He led the 4th regiment of light dragoons in 1777, taking part in the battle of Germantown. He was attached to Wayne's expedition to Bull's ferry in 1780, and was with Greene in the south next year. In 1783 he was brevetted brig.gen. In 1792 and 1793 he was register and recorder of Chester co., Penn., and was afterwards commissioner of the district of Pennsylvania.

MOZAMBIQUE', a territory on the e. coast of South Africa, nominally belonging to Portugal, and placed under a governor-general, although the actual possessions of Portugal consist only of a few stations, and her authority in the country is inconsiderable. It extends from cape Delgado, in lat. 10° 41' s., to Delagoa bay, 26° south. The chief river, the Zambesi, divides it into two portions—Mozambique proper on the n., and Sofala on the south. Area estimated at 283,500 sq.m.; pop. 300,000. These figures, however, are only to be considered approximative, as the country has no definite boundary to the west. The coasts, which comprise large tracts of cultivated soil, yielding rich harvests in rice, are fringed with reefs, islands, and shoals; and between Delagoa bay and cape Corrientes, and from Mozambique, the principal station, to cape Delgado, the shores are high and steep. The forests yield valuable ornamental woods; ivory is obtained from the hippopotami that haunt the marshes; and gold and copper are found and worked. The elephant, deer, and lion inhabit the jungle; crocodiles are found in the rivers, and numerous flamingoes on the coasts. The rainy season lasts from November to March. The summer heat is very great, and the climate, which is fine in the elevated tracts, is unhealthy on the low shores and the swampy districts. Besides numerous fruits and vegetables, the grains are rice, millet, maize, and wheat. The government is in a most inefficient state, being, in most places, more in the hands of native chiefs than of the Portuguese. In former times the slave-trade was carried on here extensively; and from 1846 to 1857 four governors-general were removed by their government for countenancing, if not actively engaging in it. The colony is divided into six districts, and is ruled by the governor-general and his secretary, assisted by a *junta*. Religion and education are supervised by about 12 Roman Catholic priests, but seem to be at the lowest ebb. Fish and turtle are caught in great quantities on the islands and reefs; pearl-fishing is a source of considerable profit; cattle, sheep, and goats are numerous, and the principal exports are grain, gold-dust, honey, tortoise-shell, cowries, gums, and amber. The Portuguese arrived here in 1497, attracted by rumors of the wealth of the country and the excellence of its ports. The principal settlements are Mozambique, Quilimane, Sena, and Tete.

MOZAMBIQUE, the capital of the Portuguese territory of the same name, is situated on a small coral island, on the eastern coast of Africa, close to the shore, in lat. 15° 2' south. It is defended by three forts, is well built, and contains a large square in which the palace of the governor and the custom-house are the chief buildings. Pop. 8,500, of whom 7,000 are slaves, 270 Christians, 102 Banyians from Hindustan, and 1150 Arabs. In former times all the markets of the world were supplied with slaves from Mozambique. Its commerce, now inconsiderable, is chiefly with India, and is carried on by Arabs.

MOZAMBIQUE CHANNEL, between the island of Madagascar and the south-eastern coast of Africa, is about 1000 m. in length, and about 450 in average breadth. At its northern extremity are the Comoro islands. Over the northern portion the monsoons blow. Black whales, yielding spermaceti, abound.

MOZARA'BIAN LITURGY, a liturgy—traced back by some to the apostles, but by the majority of writers to St. Isidore of Seville, who redacted it, in co-operation with the fathers of the 4th council of Toledo, 633—originally in use among those Christian inhabitants of Spain (Muzarabians, Mostarabians, Mustarabians) who remained faithful to their religion after the Arabic conquest. It is also called the Gothic liturgy, and differs in some respects from the Roman. Gregory VII. first compelled most of the Spanish churches and convents to adopt the common uniform liturgy of the Romish church. Six Mozarabic congregations alone, chiefly in Leon and Toledo, were allowed to retain their ancient ritual, but it soon fell into disuse even among these. Archbishop Ximenes of Toledo expressly founded a chapel at Toledo, in 1500, in which mass was to be said according to the Mozarabian manner, lest it might entirely fall into oblivion. He further caused a number of learned priests, Alfonso Ortiz among them, to collate all the different Mozarabian liturgical MSS. to be found in the different churches, chapels, and convents, and finally there was edited, under his auspices, the *Missale Mistum secundum Regulam Beati Isidori Dictum Mozarabicum* (1500–2), which has, however, by some unfortunate accident, remained incomplete. A whole third of the church-year is left out entirely. The peculiar affinity of this liturgy with the Gallican on the one, and the Greek on the other hand, makes its study extremely important for the history of the ancient church.

MOZART, JOHANN CHRYSOSTOM WOLFGANG GOTTLIEB, one of the greatest of musical composers, was b. Jan. 27, 1756, at Salzburg, where his father was sub-director of the archiepiscopal chapel. His extraordinary musical talents were cultivated to the utmost by his father. At the age of four he played the clavichord, and composed a number of minuets and other pieces still extant. When only six years of age his performances were so remarkable that his father took him and his sister, who possessed similar gifts, to Munich and Vienna, where they obtained every kind of encouragement from the elector of Bavaria and the emperor Francis I. In 1763 and 1764 the Mozart family visited Paris and London. At the age of seven young Mozart surprised a party of musicians, including his father, by taking part, at sight, in a trio for stringed instruments. Symphonies of his own composition were produced in a public concert in London; and whilst there he composed and published six sonatas, and made acquaintance with the works of Handel, recently deceased. Two years later, when but 12 years of age, he composed the music for the religious service, and for a trumpet concert at the dedication of the orphan-house church in Vienna, and conducted it in presence of the imperial court. In 1769, at the age of 13 he was appointed director of the prince archbishop of Salzburg's concerts; and in the same year traveled with his father to Italy, where he created an unheard-of enthusiasm by his performances and compositions. He composed the opera of *Mithridates* at Milan, in Oct., 1770, and it was publicly performed there in December of that year. At the age of 16 he was the first claveçinist in the world; he had produced two requiems and a stabat mater, numerous offertories, hymns, and motetts, four operas, two cantatas, 13 symphonies, 24 pianoforte sonatas, not to speak of a vast number of concertos for different instruments, trios, quartets, marches, and other minor pieces. In 1779 he was appointed composer to the imperial court at Vienna, where he then fixed his residence, and there the musical works were composed upon which his great fame chiefly depends. His office in Vienna, however, was rather honorary than lucrative, and he lived by concerts, musical tours, teaching of music, and the small profits derived from the sale of his published works, till an offer of a large salary made to him by the king of Prussia led the emperor to give him 800 florins a year. His great opera of *Idomeneo* was composed in 1780, with a view to induce the family of mademoiselle Constance Weber, afterwards his wife, to consent to the marriage, which they had declined on the ground of his reputation not being sufficiently established. This opera forms an epoch not in the composer's life only, but in the history of music. In construction, detail, instrumentation, and every imaginable respect, it was an enormous advance on all previous works of the kind, and established his repute as the greatest musician whom the world had seen. *Die Entführung aus dem Serail* followed. His six quartets, dedicated to Haydn, appeared in 1785, and in 1786 *Le Nozze di Figaro*. In 1787 he produced his *chef-d'œuvre*, *Don Giovanni*, which, though received with enthusiasm at Prague, was at first beyond the comprehension of the Viennese. *Cosi fan Tutti* appeared in 1790. To 1791, the last year of his short life, we owe *Zauberflöte*, *La Clemenza di Tito*, and the sublime requiem composed in anticipation of death, and finished only a few days before his decease. He died Dec. 5, 1791, aged 35.

In the intervals of his greater works, Mozart composed the majority of the orchestral symphonies, quartets, and quintets, which are an almost indispensable part of the programme of every concert in the present day, besides masses as familiar in England as in Catholic Europe, innumerable pianoforte concertos and sonatas, and detached vocal compositions, all of the most perfectly finished description. To Haydn, Mozart always acknowledged his obligations; but Haydn's obligations to Mozart are at least as great. Haydn, though born 24 years earlier, survived Mozart 18 years, and all his greatest works, written after Mozart's death, bear manifold traces of Mozart's influence. Mozart is the first composer in whose works all traces of the old tonality disappear; he is the father of the modern school. "No composer has ever combined genius and learning in such perfect proportions; none has ever been able to dignify the lightest and tritest forms by such profound scholarship, or, at the moment when he was drawing most largely on the resources of musical science, to appear so natural, so spontaneous, and so thoroughly at his ease." See the Lives by Holmes (Lond. 1845) and Jahn (Leip. 1856). The Life by Nohl (2d. ed. 1877) and the Letters have been translated by lady Wallace.

MOZDOK', a t. and fortress of South Russia, in the government of Caucasus, about 142 m. n. of Tiflis. Pop. '67, 8,543, chiefly Armenians.

MOZIER, JOSEPH, 1812-70; b. Vt.; removed to New York at 19 years of age, where he engaged in mercantile pursuits from 1831 to 1845, when he abandoned trade and passed the rest of his life in Italy, where he studied art and became a sculptor. His principal works are: "Esther;" "The Wept of Wish-ton-Wish;" "Jephthah's Daughter;" "Pocahontas;" "Rebecca at the Well;" and "Rizpah."

MOZLEY, JAMES BOWLING, D.D.; b. Lincolnshire, England.; graduated at Oriel college, Oxford, in 1834; elected fellow of Magdalen college, and became vicar of Shoreham, Sussex, in 1856; was appointed Bampton lecturer in 1865; canon of Worcester in 1869; regius professor of divinity, Oxford, in 1871. He is the author of *A Treatise on the Augustinian Doctrine of Predestination; Primitive Doctrine of Baptismal Regeneration; Review of the Baptismal Controversy; On Subscription to the Articles;* eight lectures on the *Miracles, being the Bampton Lectures for* 1865; *Essays, Historical and Theological, with an Introduction and Memoir of the Author; Ruling Ideas in Early Ages; Sermons, Parochial and Occasional; Theory of Development;* a Criticism of Dr. Newman's Essay on the Development of Christian Doctrine; *University Sermons,* preached before the university of Oxford, and on various occasions.

MOZYR', a t. in the government of Minsk, in Russia, 150 m. s.s.e. of Minsk. It is a town of considerable antiquity, and played a rather important part in the wars between the various Russian princes, previous to the Tartar invasion. It was unsuccessfully besieged by the Tartars in 1240. Under the Polish rule it was the chief town of a district, and remained so after its annexation to Russia in 1795. 150 barges and 200 rafts are annually freighted here with goods to the amount of 500,000 rubles. Pop. '67, 5,250.

MSKET, also written MTSCHETHA, and otherwise, one of the most ancient Georgian towns in the present government of Tiflis, and about 10 m. n.n.w. of the town of that name. It is said to have been the seat of the Georgian kings down to the 5th c., and contained the first Christian church of Georgia, built during the first half of the 4th century. In this church the Georgian kings were crowned and buried. The site of Msket is now marked by a few huts.

MTZENSK, a t. of Russia, in the government of Orel, 646 m. s.s.e. of St. Petersburg. It is situated on the Zusha, which communicates through the Oka with the Volga. The old cathedral, built on a steep rock, gives picturesqueness to the town. Mtzensk receives historical mention as far back as 1147. Its trade, chiefly with St. Petersburg and Moscow, amounts in value to upwards of 1,000,000 rubles. Pop. '67, 18,373.

MUCH WOOL'TON (i. e. *Great Woolton*), a t. of Lancashire, England, 6 m. from Liverpool. The town is rapidly increasing in size on account of the proximity of a branch of the North-western railway, which runs within two miles. Much Woolton has long been noted for a stone obtained from a neighboring quarry, which gives employment to a considerable number of men. Pop. '71, 4,643. Near Much Woolton is the village of Little Woolton, with a pop. of about 1000.

MUCILAGE, or BASSORIN ($C_{12}H_{10}O_{10}$), is a modification of gum which is insoluble in water, but when moistened with it, swells up into a gelatinous mass. It is contained abundantly in gum tragacanth; and many seeds, such as linseed, quince seed, etc., and certain roots, such as those of the marsh-mallow, furnish it in large quantity. Alkalies render it soluble in water, and convert it into true gum; and prolonged boiling in water produces the same effect. Nitric acid converts it into mucic and oxalic acids.

MUCIUS, or MUTIUS, SCÆVOLA, the name and cognomen of an ancient Roman family, the founder of which was supposed to be the legendary Caius Mucius Scævola, about 600 B.C.; who after the expulsion of the Tarquins entered the camp of Lars Porsena, their ally, and attempted the assassination of the king; failing in his purpose, and brought before Porsena, to show his contempt for torture he thrust his right hand in the flames and held it there until consumed. The monarch, moved by his courage, released him, and in return Mucius (named Scævola, left-handed, from this deed) warned him that he was but one of 300 young men sworn to take his life. The result was that Porsena, in fear of death, offered favorable terms of peace to Rome. Several of the Mucii were distinguished in Roman history, attaining the positions of prætor, tribune, and consul. Quintus Mucius, the augur, was Cicero's teacher, and an eminent expounder of the Roman law. He was consul in 117 B.C. Quintus Mucius, the pontifex, was consul in 95 B.C., and was slain in 82 B.C. by the adherents of Marius; he also was a jurist and wrote a treatise on the *Jus Civile*, and a book on legal definitions.

MUCK'ERS, the popular name of an extraordinary sect, which sprung up at Königsberg, in Germany, in 1835. The movement seems to have originated in the dualistic and Gnostic views of John Henry Schönherr (who was born at Memel in 1771, and died at Königsberg in 1826) concerning the origination of the universe by the combination of two spiritual and sensual principles. His followers carried out his system much more completely than himself. The most notable of them were two clergymen, Ebel and Diestel, the former an archdeacon. By them, sexual connection would seem to have been elevated into an act of worship, and the chief means of the sanctification of the flesh; by which the paradisiac state was to be restored. Ebel and Diestel founded a society, to which women—some of noble birth—attached themselves. Three ladies lived in Ebel's house, who were popularly regarded as his three wives; and Mr. Hepworth Dixon, in his work entitled *Spiritual Wives* (1868), tells us that one of them, a young widowed countess, whose beloved husband had fallen on the field of Lützen, and whom he enticed from the seclusion and deep melancholy in which she lived, was described by him as representing to him the principle of light (*Licht-natur*); another of the ladies represented the principle of darkness (*Finsterniss-natur*); and the third represented the principle of union (*Umfassung*). The last was his legal wife, but held the most subordinate place in his extraordinary household. Ere long public feeling was excited against the Muckers, who were said to be guilty, under forms of piety, of the most odious licentiousness in their meetings. The scandal became great in Königsberg, and a garden there acquired the name of the Seraph's grove. The subject was brought before the courts (1839–1842), and the result was that Ebel and Diestel were degraded from their offices, and the latter was further punished by imprisonment. It is alleged, however, by some who have examined the whole evidence produced, that the decisions did not proceed upon a calm judicial inquiry, but were dictated by strong prejudice against the accused, on account of their religious views and peculiar eccentricities; and, in particular, that the evidence gives no support whatever to the charge of licentiousness. Mr. Hepworth Dixon has directed attention to the similarity of the Mucker movement with that of the Princeites (see AGAPEMONE) in England and that of the Bible Communists or Perfectionists (q.v.) in America, all of which took place about the same time, and in connection with revival excitement, although it may almost be regarded as certain that the originators of these movements had not even heard of each other.

MU'COUS MEMBRANES AND **MUCUS.** Under the term MUCOUS SYSTEM, anatomists include the skin, mucous membranes, and true glands, all of which are continuous with one another, and are essentially composed of similar parts. As the skin and the glands are described in special articles, it only remains to speak of the great internal mucous tracts. These are the alimentary mucous membrane, the respiratory mucous membrane, and the genito-urinary mucous membrane.

The *alimentary mucous membrane* commences at the lips, and not only forms the inner coat of the intestinal canal from the mouth to the anus, but gives off prolongations which after lining the ducts of the various glands (the salivary glands, the liver, and the pancreas) whose products are discharged into this canal, penetrate into the innermost recesses of these glands, and constitute their true secreting element. Besides these larger offsets we find in the stomach and small intestine an infinite series of minute tubular prolongations, the anatomical arrangement and function of which are described in the article DIGESTION.

The *respiratory mucous membrane* begins at the nostrils, and under the name of *schneiderian* or *pituitary membrane*, lines the nasal cavities, from whence it sends on either side an upward prolongation through the lachrymal duct to form the *conjunctiva* of the eye; backwards, through the posterior nares (the communication between the nose and the throat), it sends a prolongation through the Eustachian tube to the middle ear (the cavity of the tympanum), and is continuous with the pharyngeal mucous membrane (which is a portion of the alimentary tract); it then, instead of passing down the œsophagus, enters and forms a lining to the larynx, trachea, and bronchial tubes to their terminations. From the continuity of these two tracts, some writers describe them as a single one, under the name of the gastro-pulmonary tract.

The *genito-urinary mucous membrane* commences at the genito-urinary orifices, lines the excretory passages from the generative and urinary organs, and is the essential constituent of the glands of both. See KIDNEY, for example.

We thus see that mucous membranes line all those passages by which internal parts communicate with the surface, and by which matters are either admitted into or eliminated from the body. As a general rule, they are soft and velvety, and of a more or less red color, from their great vascularity, but they present certain structural peculiarities according to the functions which they are required to discharge. In all the principal parts of the mucous tracts we find the mucous membrane to present an external layer of epithelium (q.v.) resting on a thin, transparent, homogenous membrane, which from its position is termed the *basement membrane*, and beneath this a stratum of vascular tissue of variable thickness, which usually presents either outgrowths in the form of papillæ and villi, or depressions or inversions in the form of follicles or glands, or both. The follicles are almost invariably present, but the papillæ and villi are limited to the alimentary or gastro-intestinal mucous membrane. "The mucous membranes," says Dr. Carpenter, "constitute the medium through which nearly all the material changes are effected that take place between the living organism and the external world. Thus, in the gastro-intestinal mucous membrane we find a provision for reducing the food by means of a solvent fluid poured out from its follicles: whilst the villi, or root-like filaments, which are closely set upon its surface towards its upper part, are specially adapted to absorb the nutrient materials thus reduced to the liquid state. The same membrane, at its lower part, constitutes an outlet through which are cast out not merely the indigestible residuum of the food, but also the excretions from numerous minute glandulæ in the intestinal wall, which result from the decomposition of the tissues, and which must be separated from them to prevent further decay. Again, the bronchio-pulmonary, or respiratory mucous membrane, serves for the introduction of oxygen from the air, and for the exhalation of water and carbonic acid. And, lastly, the mucous membranes are continuous with the cell-lined vesicles or tubes of the various glands, which are the instruments whereby their respective products are eliminated from the blood." Although the various kinds of epithelial cells discharge a special office in relation to the peculiar function of the mucous membrane upon which each kind occurs, yet they all serve one general purpose—namely, that of protecting the surfaces on which they are placed. This protecting power is increased by the presence of the secretion known as *mucus*, which ordinarily forms an extremely thin layer on these membranes, but when they are irritated or inflamed, is secreted in very considerable quantity. The exact mode of its formation is still a disputed question, but it is generally believed to be the product of the gradual solution of the uppermost epithelial cells. Besides acting both mechanically and chemically as a shield to highly sensitive membranes, it has other uses, amongst which two may be especially mentioned.—1. It communicates to the salivary, and probably to other glands, properties which are not possessed either by itself or by the pure glandular secretions; and 2. It serves to eliminate a considerable quantity of nitrogen from the system. This nitrogen is contained in the *mucin*, which forms from 2.4 to 9 per cent of nasal and bronchial mucus. This mucin contains 12.64 per cent of nitrogen, and is the substance which gives to mucus its viscid and tenacious character. Normal mucus is devoid of smell and taste, and almost, if not quite, neutral; and hence its constant presence in the mouth gives rise to no disagreeable sensation.

MUCORINI, an order of fungi very widely distributed, comprising chiefly what are known as the common moulds, which are found on decaying bread and other articles of food, or vegetable or animal matter generally. One species, *phycomyces nitens*, grows on greasy substances, a habitat not usual with most fungi. Most members of the order are very small, many of them microscopic. The *mucor mucedo* is one of the most common species and was particularly described by Dr. Brefeld in 1872. Fresh horse-dung kept in a moist place soon becomes covered with white glistening fibers, the mycelium of the *mucor mucedo*. They appear to flourish in decaying matter rich in nitrogen, and evolving ammonia. From the coating there project slight white threads, whose tips soon become black. These are the spore-bearing stalks, or *conidia*, and they manifest a strong tendency to turn toward the light which is not the case with the spore stalks of the common bread mould, they appearing to be indifferent to light. If the mycelium of *mucor mucedo* is kept moist it changes in form, and certain cross partitions increase in number, the cells produced in this way swelling into a spherical form. The protoplasm of the cells becomes developed into round bodies resembling spores, which have the power of germination. If the *mucor mucedo* is grown in a decoction of horse dung it bears only conidia. The principal genera are mucor, circinella, helicostylum, thamnidium, chætostylum, chætocladium, mortierella, piptocephalis, syncephalis, kickxella, cœmansia, martensella, and pilobolus.

MU'DAR, *Calotropis*, a genus of shrubs of the natural order *asclepiadaceæ*, distinguished by a coronet of fine blunt processes adhering to the base of the filaments. They are natives of the East Indies, and the bark of the root, and the inspissated milky juice of some of them, are much used there as an alterative, purgative, emetic, and sudorific medicine. The medicinal properties of mudar have been well known in India for many centuries, and have begun to attract the attention of European physicians. It is found of great value in elephantiasis, and in leprosy and other obstinate cutaneous diseases, as well in some spasmodic affections, and in syphilis.—The species most common in the south of India is *C. gigantea;* in the north, *C. Hamiltonii;* whilst *C. procera*, said to have an extremely acrid juice, extends into Persia, and even into Syria. Mudar is very common in India, springing up in uncultivated ground, and often troublesome in that which is cultivated. It is a large shrub, with stems often thicker than a man's leg; and broad fleshy leaves. It grows where almost nothing else will, on very dry sands, and rapidly attains a large size. The silky down of the pods is used for making a soft, cotton-like thread; but is short, and not easily spun. The inner bark also yields a strong and useful fiber, which makes excellent cordage and fishing-lines; but the mode of preparation hitherto used makes it costly.—The inspissated milky juice of mudar collected by making incisions in the bark, is used as a substitute for caoutchouc and gutta-percha. It becomes flexible when heated.—The mudar of medicine contains a principle called *mudarine*, on which its medicinal virtues are supposed to depend, and which possesses the rare property of gelatinizing when heated, and becoming fluid when again cooled.

MUD EEL. See SIREN, *ante*.

MUD-FISH, *amia*, a very curious genus of fishes, forming the family *amiidæ* of the order *ganoidei* of Müller, although its position among the *ganoidei* is determined only by anatomical characters, in which it agrees with sturgeons and the rest of that order, for the scales are not ganoid, and are not osseous plates, but are flexible and rounded, and destitute of enamel. Similar scales, however, are found in fossil genera regarded by Agassiz as ganoid. In habit the mud-fish resembles osseous fishes rather than ganoids. Except in the absence of teeth on the tongue, the mouth resembles that of a trout. The body is long and flexible, with a bony vertebral column; there are two nasal cirri; the head is flat, covered with a very thin mucous skin, immediately under which the bones appear as sculptured plates. More than ten species are known, natives of the fresh waters of America. The WESTERN Mud-fish (*A. calva*) is from a foot and a half to three feet long, bluish-black above, white below. It inhabits the great northern lakes or North America, and is found as far s. as Carolina. It feeds chiefly on crawfish and other crustaceans. It is not esteemed as an article of food, although sometimes used by the Indians.

MUDGE, BENJAMIN FRANKLIN, b. Me., 1817; graduated at Wesleyan university, 1840; afterwards studied law and practiced in Lynn, Mass., for several years. He became interested in the coal-oil and petroleum trade in Kentucky; was state geologist of Kansas in 1864–65; and the professor of natural sciences in the Kansas agricultural college. He has made several paleontological discoveries.

MUDGE, ENOCH, 1776–1850; b. Mass., one of the pioneers of Methodism in New England. He entered the church at the age of fifteen, the Methodist ministry in 1793; traveled and preached in Maine in 1796; resided in Orrington, Me., and was twice chosen state representative. Subsequently he re-entered the itineracy, and was stationed in Boston. In 1832 he was appointed chaplain to the Seamen's Bethel, New Bedford, where he labored with great success until 1844 when on account of ill-health he retired from the ministry. He was highly esteemed as a preacher, fertile in thought, and rich in illustration. He published a vol. of sermons for mariners.

MUD-HEN. See COOT, *ante*.

MUD'KI, usually spelled MOODKEE, a small t. of n.w. Hindustan, 28 m. s.e. of the Sutlej, and 70 m. s.e. of the city of Lahore, on the Ravi. It has a pop. of about 6,000. Here the first battle in the Sikh war of 1845–46 was fought (Dec. 18, 1845), when the British under sir Hugh Gough repulsed the Sikhs, and sir Robert Henry Sale, "Fighting Bob," was killed.

MUËD'DIN (*Muëzzin*), the Arabic name of the Mohammedan official attached to a mosque, whose duty it is to announce the different times of prayer. His chant (adan) consists of these words, repeated at intervals: "Allah is most great. I testify that there is no God but Allah. I testify that Mohammed is the apostle of Allah. Come to prayer. Come to security." ["Prayer is better than sleep" is added in the morning, at the subh or fegr. See MOHAMMEDANISM.] "Allah is most great. There is no deity but Allah!" Besides these regular calls, two more are chanted during the night for those pious persons who wish to perform special nightly devotions. The first (ula) continues, after the usual adan, in this manner: "There is no deity but Allah! He hath no companion—to him belongeth the dominion—to him belongeth praise. He giveth life, and causeth death. And he is living, and shall never die. In his hand is blessing, and he is almighty," etc. The second of these night-calls (ebed) takes place an hour before daybreak, and begins as follows: "I extol the perfection of Allah, the existing for ever and ever: the perfection of Allah, the desired, the existing, the single, the supreme," etc. The office of a muëddin is generally entrusted to blind men only, lest they might, from their elevation, have too free a view over the surrounding terraces and harems. The harmonious and sonorous voices of the singers, together with the simplicity and solemnity of the melody, make a strikingly poetical impression upon the mind of the hearer in daytime; much more, however, is this the case whenever the sacred chant resounds from the height of the mosque through the moonlit stillness of an eastern night.

MUEZZIN. See MUËDDIN, *ante*.

MUFTI (Arabic, *expounder of the law*). The Turkish grand mufti is the supreme head of the ulemas (servants of religion and laws), and has, together with the grand vizier (vizier azim), the supreme guidance of the state, nominally ruled by the sultan. His is the chief spiritual authority, and in this capacity he is also denominated sheikh-al-Islam (lord of the faith). The imams (priests), however, chosen from the body of the ulemas, are, from the moment of their official appointment, under the authority of the kislarage, or chief of the black eunuchs. The better class of the ulemas are the teachers and expounders of the law, from among whom the mollahs and cadis are elected. The Turkish laws have their basis in the Koran; the mufti thus, as head of the judges, acquires a spiritual authority. His also is generally the office of girding the sultan with the sword at his ascension to the throne, a ceremony which takes place at the mosque of Eyub, and which is equal to our ceremony of coronation. The mufti is elected and may be deposed by the sultan, and his position has in modern days lost much of its former dignity and importance. His fetwa, or decision, although attached to the imperial decrees, imparts to it but little additional weight. Nor is his own dictum in things spiritual always considered as finally binding. The only prerogative of muftis and ulemas which has hitherto remained untouched is their being exempt from bodily or otherwise degrading punishments; nor can their property ever be confiscated, but descends to their successors.

MÜGGE, Theodor, 1806–61, b; Berlin. After devoting himself in early life to mercantile pursuits, at the age of nineteen he started for Peru to serve as a soldier with Bolivar. The news of the expulsion of the Spaniards reached him in London, and he returned to Berlin, where he studied history, philosophy, and the sciences, but lost his chances for a university professorship by the publication in 1831 of *France and the Last of the Bourbons* and *England and Reform*. His ultra-liberal sentiments, expressed in various newspapers and in his pamphlet *Die Censurverdältnisse in Preussen*, led in several instances to his arrest and political prosecution. He was associated with the staff of the *Zeitung für die Elegante Welt*, and for some time edited the *Nationalzeitung*, the only liberal journal of Prussia. In 1850 he began the publication of an annual, entitled *Vielliebchen*. During the twenty years preceding his death he poured forth a constant succession of sketches, tales, novels, and romances. His collected works amount to thirty-three volumes. The best-known of his later writings are *The Provost of Sylt*, *Christmas Eve*, *The Oldest Son of the Family*, and the posthumous romance *The Prophet*. He died in his native city of Berlin, where he occupied a prominent position.

MUGGLETO'NIANS, a sect that arose in England about the year 1651, and of which the founders were John Reeve and Ludovic Muggleton (b. 1607, died 1697), obscure men, but who claimed to have the spirit of prophecy. Muggleton was a journeyman tailor. He professed to be the "mouth" of Reeve, as Aaron was of Moses. They affirmed themselves to be the *two witnesses* of Rev. xi. They asserted a right to curse all who opposed them, and did not hesitate to declare eternal damnation against their adversaries. They favored the world with a number of publications, one of which—particularly directed to the parliament and commonwealth of England, and to his excellency the lord gen. Cromwell—was entitled a *Remonstrance from the Eternal God*. The prophets were at that time imprisoned as nuisances "in old Bridewell." Another publication was a *General Epistle from the Holy Spirit*, dated from "Great Trinity lane, at a chandler's shop, over against one Mr. Millis, a brown baker, near Bow Lane end, London." [The first complete edition of Muggleton's works was published in 1756; another edition appeared in 1832.] The Muggletonians denied the doctrine of the trinity; they held anthropomorphist opinions; and to all this they added many strange doctrines of their own, as that the devil became incarnate in Eve, etc. The Muggletonians existed in England as a sect till more than one-fourth of the 19 c. had passed away; but the census of 1851 showed no trace of them, and they are supposed to be now completely extinct.

MUGIL'IDÆ. See Mullet, *ante*.

MUHALITCH', or Mualich, a t. of Asia Minor, in Anatolia, 13 m. s. of the sea of Marmora, and 37 m. w. of Brusa, picturesquely situated on low hills. It is large and straggling, contains about 1500 houses and three or four khans, and is the seat of a considerable trade, chiefly in exporting silks, wool, and fruits to Constantinople. Pop. 11,000.

MUHESUR', a t. of India, in the territory of Indore (q.v.), on the right bank of the Nerbudda, 280 m. n.e. of Bombay. The fort contains many houses within its inclosure, but is in bad repair. There is a new palace, built of gray basalt, and overcharged with sculptures of human beings, and of elephants, tigers, and other animals. There are also numerous and costly Hindu temples, erected by Ahalya Bai, relict of Kunda Rao, son of Maharajah Mulhar Rao. The river, which is here about 2000 ft. wide, has a rapid stream of blue water, rushing over a rocky bottom; the banks are 60 or 80 ft. high in the dry season. Access to the water is gained by a ghât, or vast flight of stone stairs, which extends below the water at its lowest level. Pop. about 17,000.

MÜHLBACH, Luise. See Mundt, Klara (Müller).

MUHL'BERG, a t. of Prussian Saxony, situated on the Elbe, 36 m. s.e. of Wittenberg. Pop. '75, 3,817. Here on April 24, 1547, a battle was fought between Johann-Friedrich, elector of Saxony, and the emperor Charles V.—a battle fraught with the most important results to the cause of Protestantism in Germany. The battle was soon decided in favor of the emperor, Johann-Friedrich was taken prisoner, and his territories were handed over to Maurice, the representative of the ducal family of Saxony. From this time till 1552 the Catholics were triumphant in Germany.

MÜHLENBERG, Frederick Augustus, 1750–1801; b. Penn,; was the son of the rev. H. M. Muhlenberg; educated at the university of Halle; and afterwards became a Lutheran minister in New York city. In 1779–80 and 1789–97 he was a member of congress from Pennsylvania. He was twice elected speaker of the house.

MUHLENBERG, Gotthelf Heinrich Ernst, D.D., 1753–1815; b. Penn.; entered the university of Halle at ten years of age, where he remained seven years; afterwards traveled in Germany and England; then returned to America, was ordained a Lutheran minister and became assistant pastor of a Lutheran church in Philadelphia, of which his father, Henry Melchior Muhlenberg, the founder of the German Lutheran church in America, was pastor. In 1777, during the occupation of Philadelphia by the British, he retired to the country, where he devoted himself to the study of botany; and it is as a botanist that he is best known. His chief works are, *Catalogus Plantarum, Amercæ Septentrionalis*, and *Descriptis Uberior Gramineom.*

MUHLENBERG, Heinrich Melchior, D.D. 1711–1787; b. Einbeck, Hanover, then a free city of Germany. His parents were Saxon, but having suffered greatly in the thirty Years' war removed to Einbeck. His father was a member of the city council, and held a judicial appointment. His mother was the daughter of a retired officer, and a woman of sense, energy, and piety. By them the son was religiously trained. The death of his father occasioned an interruption of his studies. His early life was one of privation and toil. From his 12th to his 21st year he toiled incessantly to assist in the support of the family, yet improved every leisure hour for mental culture and the acquisition of knowledge. At the age of 21 he became tutor in the school of Raphelius at Zelleafeld. In 1735 he entered the university of Göttingen, where he remained three years. The influence of Dr. Oporin, who received him into his family, and employed him as an amanuensis, was excellent, and from that time he became an active Christian. Graduating at Göttingen he went to Halle, where, besides studying he taught in the orphan house. He associated intimately with Francke, Cellarius, and Fabricius. By their advice he decided to prepare for the missionary work, and Bengal was selected as the field of his operations. Soon after his ordination, and while making arrangements for his departure to India, application came from Pennsylvania to Germany for some one to be sent to labor among the destitute of that colony. The faculty immediately selected Muhlenberg, who was then in his 31st year. He reached America in 1742, to the great joy of the German Christians. He found the church in a deplorable condition, the Lutheran population having been much neglected. His arrival marked a new era in the history of the Lutheran church in the United States, its condition gradually improved, and frequent accessions were made to the ranks of the ministry, of men educated at Halle, and thoroughly devoted to their work. He took the pastoral care of the associated churches of Philadelphia, New Hanover, and Providence, which had united in calling a minister, and these three congregations were the principal scenes of his ministerial labors, though he preached in all the Lutheran churches of his day, and his aid was often requested from neighboring churches whose differences he seldom failed to reconcile. He often made long journeys to gather the scattered flock, preach the word, administer the sacraments, introduce salutary discipline, and perform other kind services. His influence was unbounded. The first three years of his ministry he resided in Philadelphia, the next 16 in Providence. In 1776 he resumed his charge in the country. During the war of the revolution his sympathy with the colonists excited great opposition, and his life was often in peril. Though advised to remove into the interior from the scene of hostilities, he refused. He was extensively known, and his views were well understood. Many of all classes, taking advantage of his position resorted to his house. "His home," says a contemporary, "was constantly filled with fugitives, acquaintances, and strangers, with the poor and hungry, noble and common beggars. The hungry never went away unsatisfied, nor the suffering uncomforted." At his death there was deep and widespread sorrow. In many places the bells were tolled, the churches shrouded in mourning, and funeral sermons delivered. Dr. Muhlenberg was a man of rare excellence. He possessed a combination of qualities which eminently fitted him for the duties to which he was called. Gifted by nature with great mental powers which were highly cultivated, he devoted himself fully to the fulfillment of his mission. His society was sought by the learned men of the day. The university of Pennsylvania conferred upon him the doctorate in divinity, rarely conferred in those days, and only upon those of unquestioned distinction.

MÜHLENBERG, Henry Augustus, 1782–1854; b. Penn.; pastor of a Lutheran church 1802–08. He was a member of congress 1829–38, serving on a number of the principal committees. In 1835 he was an unsuccessful candidate for governor on the democratic ticket. He was offered by president Van Buren the Russian mission, and the post of the secretary of the navy, both of which he refused. In 1838 he accepted the Austrian mission which he held until 1840.

MUHLENBERG, John Peter Gabriel, 1746–1807; b. Penn.; son of Dr. Henry M. He was educated at the university of Halle, from which he ran away, and passed a year as a private in the dragoons. He studied for the Lutheran ministry under his father, and was ordained in 1772. He was for a time settled over a church in Woodstock, Va. Soon after the beginning of the revolutionary war, he told his congregation in his last sermon that there was "a time for all things—a time to preach and a time to fight, and that now was the time to fight." At the close of the services, he tore off his gown, showing himself in full uniform, and read from the pulpit his commission as col. He had the drummers strike up for volunteers, and many of his congregation volunteered and joined his regiment, the 8th Virginia, popularly known as the German regiment, afterwards noted for its courage and good discipline. In 1774 he was a member of the house of burgesses, and served on the committee of safety, and two years later he sat in the state convention. He participated in the fighting at Charleston in 1776, and was made brig.gen. the following year, and placed in command of the Virginia line. He took part in the battles of Brandywine, Germantown, and Monmouth, and in the capture of Stony Point. He defended Virginia against the expeditions of Leslie and Arnold, and was commander-in-chief there till the arrival of Steuben. Upon the invasion of Virginia by Cornwallis, he was next in command to Lafayette, and at the siege of Yorktown he was in command of the 1st brigade of light infantry. He retired at the close of the war with the rank of maj. gen. Soon after he settled in Pennsylvania, to whose executive council he was at once elected, and of which he was elected vice-president in 1785. He served in Congress in 1789–91, 1793–95, and 1799–1801. In the latter year he was elected U. S. senator, and in 1803 he was appointed collector of the port of Philadelphia.

MUHLENBERG, William Augustus, d.d., 1796–1877; b. Philadelphia; graduated at the university of Pennsylvania, 1814; ordained a minister of the Protestant Episcopal church in 1817; in 1817–21 assistant rector of Christ's church, Philadelphia, under bishop White; was rector of St. James's church, in Lancaster, Penn., 1821–28. Here he took an active part in establishing the first public school in the state out of Philadelphia. In 1828 he founded at Flushing, L. I., a school, afterwards called St. Paul's, and of which he was the principal until 1846. In 1846–58 he was rector of the church of the Holy Communion in New York, the earliest free Episcopal church. In 1858 he became superintendent and pastor of St. Luke's hospital, in New York, of which he was the founder. He had organized in 1845 the first Protestant sisterhood in the United States, which afterwards was in charge of this hospital. In the latter years of his life he was instrumental in founding an industrial Christian settlement at St. Johnland, L. I., near New York. He was an earnest advocate of Christian union. He was the author of the popular hymns, "I would not live alway," "Like Noah's weary dove," "Shout the glad tidings," and "Savior who Thy flock art feeding." He published *Church Poetry, being portions of the Psalms in verse, and hymns suited to the festivals and fasts, from various authors; Music of the Church*, in connection with bishop Wainwright; and the *People's Psalter*. He was a bright example of the mingling of earnest practical philanthropy with fervid devotion, and is held in honor by Christians of every name.

MUHLENBURG, a co. in w. Kentucky, intersected by the Paducah and Southwestern railroad; 570 sq.m.; pop. '80, 15,098—14,976 of American birth, 2,078 colored. In the n. portion the Owensboro' and Nashville railroad terminates at Owensboro' junction, or Stroud City, forming a junction with the Paducah and Southwestern railway. The Green river forms its n.e. boundary, the Muddy river its e., and a branch of the Green river its w. boundary. Its surface is hilly and well wooded, containing beds of bituminous coal and iron ore, which are extensively mined. Its soil is very productive, and adapted to tobacco, cotton, every kind of grain, and the raising of live stock. It has saw and grist mills, and tobacco factories. County seat, Greenville.

MÜHLHAUSEN, in Alsace-Lorraine. See Mülhausen, *ante*.

MÜHLHAU'SEN, an ancient city of Prussia, in the principality of Eichsfeld, on the Unstrut, 30 m. n.w. of Erfurt. It ranked in the middle ages as an important imperial free city, and is still an active center of commerce. It has manufactories for linen and woolen goods, starch, anise, and saffron works, and carpet and leather factories. Pop. '75, 20,938. Mühlhausen was deprived of its municipal independence in 1803, and made over to Prussia, with which it has since remained incorporated, excepting for a short period during the predominance of French influence in Germany, when, at the suggestion of Napoleon, it was included in the kingdom of Westphalia, but it was restored to Prussia in 1813.

MÜHL'HEIM, the name of two manufacturing towns of Rhenish Prussia, distinguished from each other as *M. an der Ruhr* and *M. am Rhein*. The former, situated on the river Ruhr, 16 m. n. of Düsseldorf, is a flourishing town, chiefly important on account of its trade in Ruhr coal. Excellent river-steamers are built here. Sandstone is extensively quarried, and iron-works and machine-factories are in operation. Cotton-spinning, weaving, printing, tanning, and paper-making are carried on. Pop. '75, 15,286. *M. am Rhein*, nearly opposite Cologne, carries on extensive manufactures of silk goods (employing 500 looms); there are dye works and paper and oil mills in operation, and considerable trade and commerce. Pop. '75, 17,350.

MUIR, John, b. Glasgow, 1810; educated in the university of Glasgow, and at the East India school at Haileybury, and engaged in the civil service in British India in 1828–53. He devoted himself to the study of Indian languages, history, and antiquities, and wrote religious tracts in Sanskrit verse. In 1853 he retired from the service and since that time has devoted his time and fortune to the advancement of oriental literature, especially in its bearing upon Christianity. Having, in 1846, offered to the university of Cambridge a prize of £500 for the best treatise on the errors of the Hindu systems of philosophy, and expounding the principles of Christianity to learned natives of India, he gave, in 1862, £5,000 to the university of Edinburgh for the endowment of a professorship of Sanskrit and comparative philology. He has done much to help the spread of Christianity among the Hindus. He has not only contributed to the transactions of Asiatic and other learned societies, but has published *Original Sanskrit Texts on the Origin and History of India, their Religion and Institutions*, 5 vols., a work of much learning and very useful to the students of Sanskrit and Indian literature.

MUIRBURN, in Scotch law, is the crime of setting fire to heather. Neither owners nor tenants, except in high and wet lands, are entitled to set fire to heather betweem April 11 and Nov. 1, though at other times they may. And persons who willfully fire heather are liable to be fined and imprisoned. In England, maliciously setting fire to heaths is one of the heads of the generic offense of arson (q. v.).

MUKDEN', or MOUKDEN, in lat. 41° 50′ 30″ n., long. 123° 37′ e., the capital of Shêng-king, the chief province of Manchuria. Its Chinese name is Tungtien-foo, signifying *affluent capital*, a translation of the Manchu Moukden, meaning *flourishing*. It lies on a branch of the river Liao, about 500 m. n.e. of Peking. The town is surrounded by a wall about 10 m. in circumference, including an inner wall 3 m. in circuit, inclosing the emperor's summer residence. Great pains have been taken by the emperors to enlarge and beautify this the metropolis of the Manchu race, but with only partial success. The family residence and place of sepulture of the founders of the reigning dynasty is Hing-king, about 60 m. e. of Mukden. It is pleasantly situated in a mountain valley near the palisade which separates the province from Kirin. The emperor Kienlung rendered himself celebrated among his subjects, and the city of Mukden better known abroad by a poetical eulogy upon the city and province, which was printed in 64 different forms of Chinese writing. In 1631 Mukden became the seat of government of the Manchu emperors, and is now the seat of several superior tribunals of a Chinese viceroy of the first rank. Nineteen leagues from Mukden is its port, Niuchwang, or Newchwang (more correctly known as Ying-tz, i.e., "camp" or "military station"), which has been opened recently to foreign commerce. It is shallow, difficult of access, and during many months of the year closed by ice. Pulse, cattle, and drugs are its chief exports. The trade with Great Britain is steadily developing, and forms already about one-third of the whole. According to the consular reports for 1875, the total value of the exports for that year amounted to £895,900 (only £13,300 for foreign ports); the total value of imports was £941,500 (£580,000 from foreign countries). Coal and iron are worked in the province, and are beginning to find a market in Newchwang.

MUKHTAR PASHA, b. in Turkey about 1832, and generally believed to have been a natural son of the sultan, Abdul Medjid. He was educated at the Constantinople military school; was rapidly promoted and became successively professor and governor of the school. In 1862 he served as a staff officer in the Montenegrin campaign, and subsequently in minor troubles with the Arabs. At the breaking out of the Bosnian insurrection he was made governor-general of Bosnia and Herzegovina, where he had some success, but incurred a severe defeat at Duja Pass, and in the Montenegrin campaigns of 1876 had, on the whole, but small success. In 1877 Mukhtar had charge of the campaign against Russia in Asiatic Turkey, and on April 29 was defeated and driven from Kars; but in a number of severely contested battles during the next two months, his troops displayed great courage and regained the position. On Oct. 11, the Russians gained an important victory over Mukhtar, driving him back to Kars, and soon afterwards to Erzeroom. The fall of Kars practically decided the war, and before the end of the year Mukhtar was recalled, and replaced by Ismail Kurd pasha.

MULATTO. See MIXED RACES.

MULBERRY, *Morus*, a genus of trees of the natural order *moraceæ*, natives of temperate and warm climates, with deciduous leaves, unisexual flowers in short, thick spikes, a 4-parted perianth, containing either four stamens or one pistil with two styles, the perianth of the female flowers becoming succulent and closing over the small pericarp, the whole spike coalescing into an aggregate fruit.—The COMMON MULBERRY, or BLACK MULBERRY (*M. nigra*), is a native of the middle parts of Asia, but was introduced into the s. of Europe more than a thousand years ago, and is now almost naturalized there. It is a low tree, much branched, with thick rough bark and broad heart-shaped leaves, which are unequally serrated and very rough. It is cultivated in the middle parts of Europe, and succeeds well in the s. of England, but in the northern parts of Britain it requires a wall. The perianth and stigmas are roughly ciliated, and the fruit is of a purplish-black color, with dark red juice, fine aromatic flavor, and subacid sweet taste. The fruit is much esteemed for dessert; an excellent preserve and a pleasant light wine are made of it. The tree often produces its fruit in prodigious quantity. The wood is employed in cabinet-work, but is not of much value. The leaves are sometimes used for feeding silk-worms. The black mulberry lives long; trees still existing in England are known to be more than 300 years old. It is propagated by seed, by suckers, by layers, or by cuttings. It succeeds best in a rich light soil.—The WHITE MULBERRY (*M. alba*) is a native of China, and has been there planted from time immemorial for the sake of its leaves, which are the best food for silk-worms; on which account also it has been cultivated in the s. of Europe since about 1540. In North America it does not succeed further n. than lat. 43°, being somewhat more impatient of frost than the black mulberry. The perianth and stigmas are smooth; the fruit is almost white, and is much less palatable than that of the black mulberry, although in this respect there is great difference among the many varieties. A rob made of it is useful in sore throat. The best variety for feeding silk-worms, on account of its rapid growth and abundant leaves, is that called the PHILIPPINE MULBERRY. In India the white mulberry is treated as a bush, and cut down twice a year; the shoots, stripped of their leaves, being thrown away, although the bark has long been used in China and Japan for making paper. It grows readily from cuttings. The root has a considerable reputation as a vermifuge.—The RED MULBERRY (*M. rubra*), a native of North America, abounding particularly on the lower parts of the Missouri, endures severe frosts much better than either of the preceding, and is therefore preferred for cultivation in some parts of Europe. Its fruit is deep red, and almost as pleasant as the black mulberry. The wood is much more valuable; being fine-grained, strong, and adapted even for ship-building. The tree attains a height of 60 ft. or more.—The INDIAN MULBERRY (*M. Indica*) has black fruit of a delicate flavor, and the leaves are extensively used for feeding silk-worms in China. Cochin-China, and Bengal.—*M. atro-purpurea* has been introduced into India from China for feeding silk-worms. *M. Mauritiana*, a native of Madagascar and Mauritius; *M. celtidifolia* and *M. corylifolia*, Peruvian species; *M. Tatarica*, a native of Central Asia; *M. lævigata*, the species most common in the n. of India; and *M. Cashmeriana*, a native of Cashmere, produce pleasant fruit; M. *dulcis*, a native of the n. of India, is said to be superior in flavor to all others.

The PAPER MULBERRY (*Broussonetia papyrifera*) differs from the true mulberries in having the female flowers collected in a globular mass. The tree is of moderate size, or, in cultivation, a bush of 6–12 ft. high; with leaves either simple or lobed, a native of India, Japan, and the islands of the Pacific ocean, but now not uncommon in pleasure-grounds in Europe and North America. The islanders of the Pacific cultivate the paper mulberries with great care. They make a kind of clothing from the bark, using for this purpose the bark of small branches about an inch in diameter, which they macerate in water, and then, scraping off the epidermis, press and beat the moist slips together. The paper also, which is used in Japan and many parts of the east, is in great part made from the bark of the young shoots of this plant, which for this purpose is boiled to a pulp, and treated somewhat in the same way as the pulp of rags in Europe. When the shoots are cut, new ones spring up very rapidly.—Silk-worms eat the leaves of the paper mulberry. —The fruit is oblong, of a dark-scarlet color, sweetish, but insipid.

MULDER, GERARD JOHANNES, a distinguished living chemist, was b. in 1802 at Utrecht, where his father was practicing as a physician. After obtaining the degree of doctor of medicine at the university of his native town in 1825, he commenced the practice of his profession at Amsterdam, where he was appointed to teach botany, and subsequently chemistry, in the newly-established medical school of that city. In 1841 he was elected professor of chemistry at the university of Utrecht, in consequence of the ability he had displayed in various memoirs published in the Dutch scientific journals. He is best known to the general reader as the discoverer of proteine (q.v.), which he maintains to be the main ingredient of albumen, fibrin, casein, etc.; but the existence of which as an independent chemical compound is at the present day not generally admitted. He is the author of numerous excellent works on physiological and agricultural chemistry, on the chemistry of wine and beer, on diet and nutrition, etc., which, in consequence of their being written in Dutch, are far less known in this country than they deserve. His *Chemistry of Vegetable and Animal Physiology* has been translated into English by Dr. Fromberg, and his *Chemistry of Wine* by Dr. Bence Jones.

MULE (Lat. *mulus*, supposed to be connected with Gr. *molos*, labor, and with Eng. *moil*), a hybrid animal, the offspring of the male ass and the mare, much used and valued in many parts of the world as a beast of burden. The ears are long; the head, croup, and tail resemble those of the ass rather than those of the horse; but in bulk and stature the mule approaches more nearly to the horse. The mule seems to excel both the ass and the horse in intelligence; it is remarkable for its powers of muscular endurance; and its sure-footedness particularly adapts it to mountainous countries. It has been common from very ancient times in many parts of the east; and is much used also in most of the countries around the Mediterranean sea, and in the mountainous parts of South America. Great care is bestowed on the breeding of mules in Spain and Italy, and those of particular districts are highly esteemed. In ancient times the sons of kings rode on mules, and they were yoked in chariots. They are still used to draw the carriages of Italian cardinals and other ecclesiastical dignitaries. Both in Spain and in South America mules employed to carry burdens are driven in troops, each preceded by an animal—in South America usually an old mare—called the *madrina*, or godmother, to the neck of which a little bell is attached, and the mules follow with the greatest docility. When troops mingle in their halting-places or elsewhere, they are readily separated, as they recognise at once the sound of their own bell. Mules are comparatively little used in Britain, although it is alleged that work is done at less expense by the employment of mules than by the employment of horses.

As in other hybrid animals generally, males are more numerous among mules than females, in the proportion, it is said, of two or three to one. There is no instance on record of offspring produced by two mules; but instances occur, although rarely, of their producing offspring with the horse and with the ass. The mule is very superior in size, strength, and beauty to the hinny, the offspring of the male horse and the female ass.

MULE. See Spinning.

MULGRAVE, Constantine John PHIPPS, Lord, 1744–92; b. England; son of baron Mulgrave, an Irish peer. He entered the British navy at an early age, and was made post-captain in 1765. He was returned to parliament as member for Lincoln in 1768, and distinguished himself in the debates on libels and on the Westminster election; on the latter subject he published a pamphlet. In 1773 he started, with two ships, on an exploring expedition towards the n.e. Arctic regions, and was stopped by ice at 80° 48′ n. lat. He gave an account of this voyage in his *Journal of a Voyage towards the North Pole*, 1774. He was appointed commissioner of the admiralty, and in 1790 raised to the British peerage as baron Mulgrave.

MULGRAVE, Henry PHIPPS, first earl of, viscount Normanby, 1755–1831; b. England: served in the British army through the revolutionary war. He afterwards became a member of Pitt's cabinet, was conspicuous for his opposition to Roman Catholic emancipation, was appointed first lord of the admiralty in 1807, and five years later was made earl of Mulgrave and viscount Normanby.

MULGRAVE, John Sheffield, Earl of. See Buckingham, or Buckinghamshire, Duke of.

MULGRAVE ISLANDS, an archipelago in the Pacific ocean, lying between lat. 8° s. and 12° n. and long. 160° and 177° e.; composed of the groups of Brown, Raiick, Radack, Scarborough, and Kingsmill. The name is also applied, in a more limited sense, to the small group of the Radack chain, which was examined by lieut. Percival in 1825. The group forms a circular chain of narrow strips of land, about half a mile wide, inclosing an inland sea 140 m. in circumference. The islands are low and of a coral formation.

MULHAUSEN (Fr. *Mulhouse*), a town of Germany, in the imperial territory of Alsace-Lorraine. Pop. '75, 58,513. Mülhausen is built on a small island between the Ill and the Rhone and Rhine canal, and is an important station on the Strasburg and Basel line of railway. It lies in a fertile, well-watered district, and ranks as one of the most active centers of trade in Alsace; while it is also the seat of a tribunal of commerce, and of various mercantile and trade unions, which have exercised a beneficial influence on the industrial activity of the country. Its numerous manufactories produce superior woolen and fine cambric goods, excellent leather, morocco, and carpets; in addition to which, its printing and dye works for cotton, muslin, wool, and silk fabrics are almost unrivaled in regard to the delicacy of the colors and elegance of the patterns employed. Mülhausen has extensive bleaching-works, and is noted for its cotton and woolen stocking manufactories, its breweries and distilleries, starch and straw works, and for its iron-works, in which locomotives and various forms of steam-engines are extensively manufactured. These manufactures, together with corn, wine, and brandy, form the staple articles of its very extensive trade.

Mülhausen early acquired commercial importance, having been erected into a free imperial city by Rudolph of Hapsburg in 1273. By siding with some of the Swiss cantons in the 14th c., it was enabled to maintain a certain degree of neutrality in the feuds between the empire and France. In 1523 Mülhausen adopted the reformed faith. It remained a part of the circle of the upper Rhine till 1798, when it was incorporated with France. It became a town of the German empire after the war of 1870–71.

MULL, after the isle of Skye, the largest of the inner Hebrides, belongs to the county of Argyle, and is washed on the w. and s. by the Atlantic, and bounded on the n.e. by the sound of Mull. It is triangular in shape, hollowed on the w. side by an inlet of the Atlantic, and is deeply indented by sea-lochs, of which the principal are Loch-na-Keal and Loch Screidan. Area about 237,000 statute acres, of which 12,470 are arable; pop. '71, exclusive of the neighboring islets, 5,947. Its surface is for the most part occupied by mountains, generally rounded in outline, and rising in Ben More 3,185 ft. high. Of its fresh-water lakes, Loch Erisa and Loch Ba are the chief. Wood abounds in the north; but owing to the generally tame character of the mountains, the great stretches of moorland, and the absence of well-defined valleys, the scenery, with the exception of that on the coast, is uninteresting. The land under cultivation occurs chiefly on the shores and at the heads of the several lochs. The soil is unusually fertile; but the great humidity of the climate, and the frequency and violence of the gales, render it almost wholly unfit for agriculture. The land is principally laid out in stock-farms, and great numbers of cattle, sheep, and horses are reared and exported. Chief town, Tobermory (pop. 1844), in the north. The harbor of Tobermory is one of the best and safest in the Hebrides. A low-water pier was completed here in Mar., 1864. It enables steamers to land in any state of the tide. The sound of Mull, 20 m. long, by 2

m. in average breadth, separates the island from the mainland of Argyleshire on the north-east.

MULLA'NY, J. R. M., b. N. Y., 1818; entered the navy in 1832, and was made lieut. in 1844. In the Mexican war, he was stationed on the coast of Mexico. He was appointed commander in 1861, and was captain of the *Oneida* at the battle of Mobile bay, Aug. 5, 1864, was severely wounded, and lost his right arm. He became commodore in 1870, and rear-admiral in 1874.

MULLEIN, a genus of plants (*verbascum*) of the natural order scrophulariaceæ, consisting of tall, more or less woolly, biennial or perennial herbs with flowers in dense spikes or terminal racemes. Calyx five-parted, corolla somewhat unequally five-lobed, wheel-shaped, five woolly stamens, and a two-celled, two-valved, many-seeded capsule. Three European species, *V. blattaria*, *V. lychnitis*, and *V. thapsus*, have been naturalized in North America, and in Europe the leaves and flowers of two allied species, *V. thapsiforme*, and *V. phlomoides*, are also collected. The only species growing in North America which is used in medicine is *V. thapsus*, the common mullein, so often met in pasture-fields and on roadsides. It has leaves from 8 to 12 in. long, the upper ones sessile, and all decurrent, varying in shape from elliptic to oblong and oval-lanceolate; more or less crenate on the margin, and thickly covered with soft white hairs. They have but little smell, are mucilaginous, and have a faintly bitter taste. The corolla and the adhering stamens are the only part of the flower which is collected for the shops generally. The corolla is about 1¼ in. broad, the three upper stamens having filaments covered with white wool; the two lower ones longer and smooth, with elongated decurrent anthers. The flowers are thoroughly dried and kept in dry, well-stoppered bottles, which preserves their delicate color; dampness causes them to turn dark. Morin obtained from them a trace of a yellowish volatile oil, a fatty substance, sugar, and coloring matter, which is insoluble in ether and cold water, but yields an alcoholic solution which gives a yellow precipitate when treated with a solution of acetate of lead. The leaves (*folia verbasci*) furnish the principal medicinal properties of the plant, but the flowers are used to make poultices, and the whole flower, with the peduncle, is often used by the Germans to make a gargle for ulcerated sore throat. An infusion of the leaves is used in catarrhal affections of the respiratory organs and the bowels, and in cystitis oil impregnated with the volatile oil of the flowers is used in Germany for frost bite and hemorrhoids.

MULLENS, Joseph, d.d., 1820–79; b. London, entered Coward college in 1837; took the degree of b.a. in 1841 at the university of London; was ordained in 1843, and the same year embarked for Calcutta as a missionary of the London missionary society. He prepared statistics of the missions in India and Ceylon, and visited the mission. In 1858 he visited England. In 1865, being invited to be assistant secretary with Dr. Tidman, he returned to England after visiting the missions in India and China. At Dr. Tidman's death he became sole foreign secretary. In 1870 he was sent as a delegate of the London society to the American board. After an absence of 15 months under commission to visit the Madagascar mission, he published *Twelve Months in Madagascar*. The directors having accepted from Mr. Arthington, of Leeds, in 1875 a liberal offer of help for a new mission on lake Tanganyika, central Africa, Dr. Mullens accompanied the party, to direct the organization of the new mission. Arriving at Zanzibar, he concluded to go into the interior. The exposure and fatigue prostrated him, and he died of peritonitis, July 10. Dr. Mullens received the degree of d.d. from Williams college, Mass., in 1861, and from the university of Edinburgh in 1868. Besides the work on Madagascar, he published *A Brief Review of Ten Years' Missionary Labor in India, between* 1852 and 1863; *London and Calcutta compared in their Heathenism, Privileges, and Prospects*.

MÜLLER, Charles Louis, b. Paris, 1815; studied art at the school of fine arts, and with Gros and Cogniet. He was director of the Gobelin tapestry factories 1850–53, and became Flandrin's successor at the school of fine arts in 1864. His first exhibited picture was "Christmas Morning" (1837). His greatest work is "The Appeal of the Victims of the Terror." Among his other works may be mentioned "The Martrydom of St. Bartholomew," "Desdemona," and "Lanjuinais at the Tribune" (1869).

MÜLLER, Ferdinand von, Baron, b. Germany, 1825; educated at Kiel. He went to Australia in 1847, and for the next 5 years was engaged in botanical explorations. In the latter year he was appointed government botanist of the colony of Victoria. He was director of the Melbourne public garden 1857–73. He is the author of *Fragmenta Phytographiæ Australiæ; Plants of Victoria; Flora Australiensis*, 6 vols.; and other works. The king of Würtemberg ennobled him, in 1871.

MÜLLER, Friedrich, a German philologist; b. at Jeunik, Bohemia, 1834; studied in Vienna in 1853–57: was librarian there in 1858–66; became in 1869 professor of comparative philology and Sanskrit at the university, and a member of the academy of sciences. He is considered one of the highest authorities in comparative philology and ethnology, and has contributed largely on these subjects to periodicals. His principal works are *Reise der oesterreichischen Fregatte Novarra; Linguistischer Theilr; Ethnographischer Theil; Allgemeine Ethnographie*.

MÜLLER, Friedrich Max (Maximilian), one of the most eminent living orientalists, was born at Dessau, in the duchy of Anhalt-Dessau, Dec. 6, 1823. His father, Wilhelm Müller, distinguished not only for his worth as a man, and his extensive and thorough scholarship, but as one of the first German lyric poets, was librarian of the ducal library, but died prematurely, Oct., 1827. Müller received the elements of his education at Dessau, and then went to Leipsic, where, under prof. Hermann Brockhaus, he began the study of Sanscrit. This he soon chose as his special pursuit; and the first fruits of his labors appeared in a translation of the *Hitopadesa* (Leip. 1844). In 1844 he went to Berlin to study under Bopp and Shelling, and consult the Sanscrit MSS. to be found there. In Paris, whither he repaired in 1845, he began, at the instigation of Burnouf, to prepare for an edition of the Rig-Veda, with the commentary of Sâyanâcârya. With this view he came to England, June, 1846, to examine the MSS. in the East India house, London, and the Bodleian library at Oxford; and, on the recommendation of the late prof. H. H. Wilson, the East India company commissioned him (1847) to edit the Rig-Veda at their expense. The first volume of this great undertaking, printed at the Oxford university press, appeared in 1849; and the sixth and concluding volume was published in 1874. In 1850 Müller was appointed deputy Taylorian professor of modern languages at Oxford; in 1854 he succeeded to the professorship; and in 1858, was elected a fellow of All Souls. While pursuing his labors connected with the Rig-Veda, Müller has published treatises on a variety of philological topics, which have done more to awaken in England a taste for the science of language in its modern sense (see GRAMMAR) than the labors of any other single scholar. Inheriting the poetic imagination and fire of his father, Müller has at command such a felicity of illustration, that subjects dry under ordinary treatment, become in his hands attractive. He has published a translation into German of Kâlidâsa's *Megha-dûta* (König. 1847); *The Languages of the Seat of War in the East* (2d ed. Lond. 1855); *Comparative Mythology* (in the Oxford Essays for 1856); *History of Ancient Sanscrit Literature* (2d ed. Lond. 1860); lectures on *The Science of Language*, delivered at the Royal institution, London, in 1861; a second series, delivered in 1863. In 1868 he delivered the Rede lecture at Cambridge, "On the Stratification of Languages;" and, in 1870, at the Royal institution, London, a course of lectures "On the Science of Religion." *Chips from a German Workshop*, in 4 vols., were published 1868–75. He is one of the eight foreign members of the institute of France, and has received the degree of LL.D. from Cambridge and Edinburgh.

MÜLLER, GEORGE, b. Kroppenstädt, Prussia, in 1805; was sent between the ages of 10 and 11 to the cathedral classical school at Halberstadt to prepare for the university. At the age of 15 he left the school and read the classics with Dr. Nagel. After spending 2¼ years at the gymnasium of Nordhausen, he entered the university of Halle, and obtained permission to preach in the Lutheran church. In 1826 he began preaching, fired with a missionary zeal, "living for two months in free lodgings provided for poor students in divinity." He wrote to a titled lady of Frankfort of known liberality for a temporary loan; no answer came; but he received the amount asked from some one who had heard of his application, with an anonymous letter written in a very Christian tone. In June, 1828, he was invited to London by the society for promoting Christianity among the Jews, to engage in its service for six months; but, as the Prussian law required from him three years military duty, he was unable to accept. But a severe illness rendering him unfit for military service, he was exempted, and in Mar., 1829, reached London. He studied Hebrew and Chaldee, Becoming ill he went to Teignmouth for medical aid. Unable to conform to the discipline of the Jews' society, he ceased to be one of its students in 1830. He then settled as pastor of Ebenezer chapel, laboring also in Bristol. He gave up pew rents, and depended on voluntary gifts, for which a box was placed in the chapel. Often reduced to a few shillings he made known his wants "to the Lord only," and they were supplied. In 1834 he and his co-laborers established the scriptural knowledge institution for home and abroad, "to assist day schools, Sunday-schools, and adult schools, to supply cheap Bibles, and aid missionary societies." In Dec., 1835, after a visit to the continent, he published a proposal for the establishment of an orphan house for destitute children bereft of both parents. In a second statement, dated Jan. 16, 1836, he said: "It is intended to receive the children from the 7th to the 12th year, and to let them stay in the house till they are able to go to service. Spontaneous offers of money and service were received, and the opening of the home was announced May 18, 1836. By May, 1837, there were 64 children in the two houses, and at the end of that year Mr. Müller published the first part of his narrative. At the end of 1838, there were 86 orphans in three houses; at the end of 1856, there were 297. He wrote: "Without any one having been personally applied to for anything by me the sum of £84,441 6s. 8¼d. had been given to me for the orphans, as the result of prayer to God." He states how this has been expended, and he acknowledges the gifts sent to him for his own use. The number of orphans increased, and the buildings were multiplied until in 1875, "2,000 children were lodged, fed, and educated, without a shilling of endowment, without a committee, without organization, by funds drawn from all parts of the world." In addition to the support of his orphans, Mr. Müller through his institution sustains "numerous foreign and home missionaries and schools, and provides for the circulation of vast numbers of the Scriptures and religious tracts," refusing to make any appeal, or hold any meetings, relying on the efficacy of faith and prayer. Believing that he is an instrument in God's hand, working by faith and prayer, he says he issues no advertisements or handbills of any of his services. His *Narrative* and other books and pamphlets have a large sale, and are among the means for giving information of his work. He is rightly held in high esteem for sincerity of character and grand usefulness: his work is its own testimonial both as to its Christian sources and its practical results. It is suggested by some that his advertised abstinence from all advertisement and solicitation is itself the most moving solicitation to the public heart; and that while his success is to be surely counted an answer to prayer, the prayer in this case, no less than in others, is answered in the use of the adequate instrumentalities.

MÜLLER, GERHARD FRIEDRICH, 1705–83; b. Germany; educated at Leipsic. Entering the newly established St. Petersburg academy, he gave instruction in history, geography, and Latin, and was soon appointed professor of history. In 1740 he went to Siberia, where he remained 10 years engaged in the study of its antiquities and geography. On his return, he became historiographer to the empire, and, in 1766, keeper of the national archives. He drew up for the government a collection of its treaties, and wrote a number of works on Russian history, whereon he was the first authority. His most important book, a *Collection for the History of Russia*, appeared at St. Petersburg, in 9 vols., from 1722 to 1764.

MÜLLER, JOHANN, historian of Switzerland, was b. Jan. 3, 1752, at Schaffhausen, where his father was clergyman and rector of the gymnasium. He studied at Göttingen under Heyne, Schlözer, Walch, and others. In 1772 he was appointed professor of Greek at Schaffhausen, and in the same year published his first work, *Bellum Cimbricum* (Zür. 1772). Already he had commenced to devote his leisure hours to the investigation of Swiss chronicles and documents. By the advice of his friend Bonstetten, he went to Geneva in 1774, where he became a private tutor; and also (1778) delivered a series of lectures on "Universal History," afterwards published in 24 volumes. In 1781 he was called to the Collegium Carolinum at Cassel, as professor of statistics, and a little earlier published the first volume of his great work, *Geschichte der Schweizer*. In 1786 he was appointed librarian and councilor of state to the elector of Mainz; here he finished the 2d volume of his Swiss history; his *Darstellung des Fürstenbundes* (Leip. 1787); and *Briefe zweier Domherren* (Frankfürt, 1787). In 1792 he went to Vienna, where the emperor Leopold gave him a situation in the privy council, and, in 1800, appointed him first imperial librarian. In 1804 he left Vienna for Berlin, where he wrote *Ueber die Geschichte Friedrich's I.*, *Ueber den Untergang der Freiheit der Alten Völker*, *Versuch über die Zeitrechnungen der Vorwelt*, and an additional volume of his Swiss history. Introduced to Napoleon after the battle of Jena, he was appointed by him (1807), having been previously dismissed from the Prussian service, secretary of state in the new kingdom of Westphalia; but died at Cassel, May 29, 1809. Müller's *Sämmtliche Werke* were published, 27 vols. Stuttgart, 1810–19; new edit., 40 vols., 1831–35.

MÜLLER, JOHANN, one of the most eminent physiologists of the present century, was b. at Coblenz on July 14, 1801. He began to study with a view to orders in the Roman Catholic church; but in 1819 he abandoned his theological studies and devoted himself to medicine, taking, in 1822, the degree of doctor of medicine at Bonn. Whilst yet a student, he wrote for a prize the treatise *De Respiratione Fœtus* (Leip. 1823). He became, in 1824, a tutor; in 1826, an extraordinary, and in 1830, an ordinary professor of physiology and anatomy at Bonn; and in 1833 succeeded Rudolphi as professor of anatomy at Berlin. His physiological researches were most industriously prosecuted, and were rewarded by many discoveries, which obtained for him a high reputation in the scientific world. He died of apoplexy at Berlin, April 28, 1858. His works are numerous, and many of them occupied with particular topics in zoology and comparative anatomy. Among the most important are—*Zur vergleichenden Physiologie des Gesichtssinns des Menschen und der Thiere* (Leip. 1826); *Grundriss der Vorlesungen über die Physiologie* (Bonn, 1827); *Grundriss der Vorlesungen über allgemeine Pathologie* (Bonn, 1829; *De Glandularum Secernetium Structura Penitiori earumque prima Formatione in Homine atque Animalibus* (Leip. 1830); *Ueber die organischen Nerven der erectilen männlichen Geschlechtsorgane*, etc. (Berlin, 1835); and *Handbuch der Physiologie des Menschen* (2 vols. 4th ed. Coblenz, 1851). "Manual of the Physiology of Man," which has been translated into French and English. He was also the author of a large number of dissertions on a variety of subjects connected with physiology, the most important of which have been separately published. His latest investigations, on infusoria, were published in 1860. The most eminent living physiologists of Germany received their training in his school.

MÜLLER, JOHANN, early German mathematician. See REGIOMONTANUS, *ante*.

MÜLLER, JOHANN FRIEDRICH WILHELM, 1782–1816; b. Germany; studied engraving under his father, Johann Gotthard, at Stuttgart, and at the academy and the Louvre in Paris. In 1808 his engraving of "St. John about to write his Revelation," after Domenichino, won him a high reputation, which was maintained by his "Adam and Eve under the Tree of Life," after Raphael. In 1814 he was appointed professor of engraving in the Dresden academy, and the rest of his life was devoted to the execution of the plate of his greatest work, the "Madonna di San Sisto," after Raphael's picture of that name, in the Dresden gallery. His engravings are only 18 in number, mostly portraits, including Schiller, Jerome Bonaparte, the king of Würtemberg, the poet Jacoby, and a medallion of Napoleon I.

MÜLLER, Johann Gotthard von, 1747–1830; b. Würtemberg; educated at the Stuttgart art academy, where he showed such a talent for design that he was allowed to give up his studies for the church, for which he had been intended, and make art his profession. He at first studied under the court painter Guibal, but, developing a talent for engraving, went to Paris in 1770, where, for six years, he studied under the engraver Wille. There he won a number of prizes, and was elected a member of the French academy. In 1776 duke Karl recalled him to Stuttgart, where he taught for 9 years, when he was summoned to Paris to engrave a portrait of Louis XVI., by Duplessis. Next in importance to this is his engraving of Trumbull's "Battle of Bunker Hill." He became professor of engraving on his return to Stuttgart, where his son Johann Friedrich was his most proficient pupil. He was elected a member of the principal European academies, and was knighted in 1818. Besides those mentioned, his best works are a "Madonna della Leggiola;" a "St. Catherine with two Angels," after Leonardo da Vinci; and a "Schiller," after the portrait by Graf.

MÜLLER, Julius, a German theologian, was b. at Brieg, April 10, 1801, and was a brother of Charles Otfried Müller (q.v.), the antiquary. He studied at Breslau and Göttingen, at first devoting himself to law, but afterwards to theology. After much mental struggle he adopted religious views opposed to those of the rationalists. In 1825 he was appointed pastor at Schönbrunn and Rosen, near Strehlen, where he remained 7 years. Having acquired a high reputation for theological learning, he was appointed in 1831 second university preacher in Göttingen, and there lectured on practical theology and pedagogics. The spirit in which he labored there may be seen from his sermons, entitled *Das Christliche Leben, seine Kämpfe und seine Vollendung* (The Christian Life, its Struggles and its perfection; Bresl. 1834; 3d ed. 1847). In 1834 he became extraordinary professor of theology in Göttingen, and soon after ordinary professor in Marburg, from which he went in 1839 to occupy a similar chair in Halle. The work on which his reputation as a theologian chiefly rests is that on sin, *Die Christliche Lehre von der Sünde* (Bresl. 1839; 4th ed., revised and much altered, 2 vols., 1858), which has been translated into English. He afterwards published pamphlets on subjects of temporary interest, particularly in vindication of the cause of evangelical union against the attacks of the rigid Lutherans. He died Sept. 27, 1878. It was he who, in 1850, in conjunction with Neander and Nitzsch, edited a periodical entitled *Deutsche Zeitschrift für Christliche Wissenschaft und Christliches Leben.* He also contributed to the *Theol. Studien und Kritiken.* His work *Die Evangelische Union* appeared in 1854. He died in Oct., 1878.

MÜLLER, Karl Otfried, one of the most genial, richly erudite, and industrious classical archæologists of modern times, was b. Aug. 28, 1797, at Brieg, in Silesia. He was the son of a clergyman, and received a careful education. He studied at Breslau and Berlin. His taste for philological and archæological studies was early developed. The first fruit of his learning was the publication of the *Aegineticorum Liber* (Berl. 1817), after which he soon received an appointment to the *Magdalenum* in Breslau, where his leisure hours were devoted to a grand attempt to analyze the whole circle of Greek myths. In 1819 he obtained an archæological chair in Göttingen; and to thoroughly prepare himself for it, visited the collections in Germany, France, and England. His great design was to embrace the whole life of ancient Greece, its art, politics, industry, religion, in one warm and vivid conception—in a word, to cover the skeletons of antiquity with flesh, and to make the dry bones live. With this view he lectured and wrote with a fine earnest animation, until the political troubles in Hanover made his position uncomfortable. He obtained permission to travel, and made tours in Greece and Italy, but unfortunately died of an intermittent fever at Athens Aug. 1, 1840. Müller's literary and scholarly activity stretched over the whole field of Greek antiquity. We are indebted to him for many new and striking elucidations of the geography and topography, literature, grammar, mythology, manners, and customs of the ancients. His work on the Dorians (*Die Dorier*, translated into English by sir George Cornwall Lewis and Henry Tuffnell) forms the 2d and 3d vols. of his *Geschichte Hellen, Stämme und Staaten* (new and improved ed. 3 vols. Bresl. 1844); his treatise *Ueber die Wohnsitze, Abstammung und ältere Geschichte des Macedon. Volks* (Berl. 1825); his *Etrusker* (2 vols. Bresl. 1828); and his maps of Greece, are works of the highest importance in the departments of ancient history and ethnology. His *Handbuch der Archäologie der Kunst* (Bresl. 1830, 3d ed. 1846; English by Leitch, London, 1850) is full of learning and of acute original observations. His *Prolegomenen zueiner wissenschaftlichen Mythologie* (Gött., 1825) led the way to a strictly historical explanation of the ancient myths. The work by which he is probably best known in England is his *History of the Literature of Ancient Greece* (Lond. 1840), undertaken at the request of the British "society for the diffusion of useful knowledge." Müller died before finishing it; what he had finished was translated into English by sir George Cornwall Lewis and Dr. Donaldson, the latter of whom continued the work from where it left off—at the age of Alexander—down to the taking of Constantinople. The German original was published by Müller's brother (Bresl. 1841). He showed himself also an acute and judicious critic in his editions of Varro, *De Linguâ Latinâ*, Festus, *De Significatione Verborum*, etc. His contributions to periodicals, encyclopedias, etc., were likewise numerous and valuable.—**Müller, Julius**, brother of the preceding, was born at Brieg, Apr. 10, 1801, educated at Breslau, Göttingen, and Berlin, and after holding several offices, finally became a professor of theology at Halle. His best known work, *Die Christliche Lehre von der Sünde* (The Christian Doctrine of Sin; English, Edin. 1856), is considered by theological critics the most acute and profound treatise written in modern times on this mysterious subject.

MÜLLER, Othon Frederick, 1730–84; b. Copenhagen; became tutor to a young nobleman, with whom he traveled over Europe, studying natural history. In 1763 he published a work on fungi, which was followed by two works on the insects and plants of the district where he lived. The titles of these works were: *Fauna Insectorum Friedrichsdaliana*, 1764; and *Flora Friedrichsdaliana*, 1767. He was then appointed by Frederic V. of Denmark, to continue the *Flora* of Denmark, of which work Oeder had published 3 vols. to which Müller added two. In 1771 he published in German a treatise *On Certain Worms Inhabiting Fresh and Salt Water*. In this work he gives an account of the structure and habits of annulose animals. His *Vermium Terrestrium et Fluviatilium seu Animalium Infusoriorum, Helminthecorum, et Testaceorum non Marinorum, succincta Historia*, which appeared between 1773 and 1774, describes the infusory animalcules, of which he discovered many new species, and which he was the first to divide into genera and species. It also contains a classification of the testaceous mollusca. In his *Hydrachnæ in Aquis Daniæ Palustribus Detectæ et Descriptæ*, 1785, he describes a large number of minute animals hitherto unknown. In 1777, he published a catalogue of the animals of Denmark, under the title of *Zoologicæ Danicæ Prodromus*. In 1779 he began the publication of his *Zoologia Danica*, which was intended to correspond in the animal kingdom, with his *Flora* in the vegetable; but only two parts were ever published. In 1786 was published, edited by his friend Otho Fabricius, a posthumous work on the infusory animalcules.

MÜLLER, Peder Erasmus, 1777–1834; b. Copenhagen; studied at the university there, passing his theological examination 1791. After spending 18 months at some of the German universities he visited France and England. Returning he wrote numerous works, was appointed professor of theology in 1801; bishop in 1822; in 1830 bishop of Zealand, the highest ecclesiastical position in Denmark. He was an eminent theologian, and his theological works on *The Christian Moral System; Grounds for Belief in the Divinity of Christianity; Creeds of the Christian Church*, all in Danish, are very highly valued; but his literary reputation rests upon his essays on Danish and Norse antiquities. Of these the most valuable are, *On the Importance of the Iceland Language; On the Rise and Decline of Icelandic Histonography; On the Author of the Edda of Snbrro; Critical Examination of the Last Seven Books of Saxo Grammatious; Critical Examination of the Traditional History of Denmark and Norway;* and above all his *Sagabibliothek*, or *Library of the Sagas*, 3 vols. In this he gives an analysis of the contents of all the Icelandic *sagas* or *stories* now existing. He was the editor in 1805–30 of the *Danish Literary Gazette*, the oldest literary journal in Denmark, and one of the only three in Europe, which have been continued for a century without interruption.

MÜLLER, Sophie, 1803–30; b. Mannheim; a distinguished German actress. She made her first appearance on the stage in her 15th year. She acted at Vienna, Dresden, and Berlin, where her performances were highly applandad. She was also reader to the empress of Austria.

MÜLLER, Wilhelm, 1795–1827; b. Germany; educated at the university of Berlin, where he cultivated philology and early German literature. After serving in the Prussian army through the campaign of 1813, he devoted himself to the study of literature, and especially of early German poetry; as a result of the latter study, his *Blumenlese aus den Minnesänger* appeared in 1816. It was followed, two years later, by a translation of Marlowe's *Doctor Faustus*. After spending some time in Vienna, where he learned modern Greek, he made an Italian tour, of which he gave an account in his *Rom, Römer, and Römerinnen*. Returning to Germany, he was appointed teacher of classics in the Dessau school, and librarian of the ducal library. His literary reputation was raised to a high pitch by the publication of his *Gedichte aus den Hinterlassenen Papier en Eines Reisen den Waldhornisten*, in 1824, and his *Lieder der Griechen* the next year. He particularly excelled in the composition of what are called by the Germans *Reiselieder* or *Wanderlieder*, lyrics of travel and out-door life. He contributed to *Urania*, and other periodicals, and to encyclopædias. He was the father of Max Müller.

MULLER, William John, 1812–45, b. England; studied landscape under the painter J. B. Pyne, and made a sketching tour through Germany, Switzerland, and Italy. His first exhibited picture of "Peasants on the Rhine" was not successful, and to improve himself in his art he made a long tour through Greece and Egypt, studying the remains of ancient architecture. In 1840 he exhibited at the academy pictures of "Athens" and "Memnon," which showed great progress. Two years afterwards his "Picturesque Sketches of the Age of Francis I." gave him a high reputation. In 1843 he joined sir Charles Fellows in the expedition to bring the Xanthian marbles to London. As a result of this journey he exhibited in the academy of 1845 five pictures: "Head of a Cingari;" "Tent Scene;" "Turkish Merchants;" "The Burial Ground at Smyrna," and

"Cannon of the Knights Templars." These pictures were hung to such a disadvantage as to escape the attention of most of the spectators; and Muller is said to have died from chagrin in consequence. He exhibited at the British institution, the year of his death, a "Dance at Xanthus," and a "View of Rhodes." Of his other works, some of his earlier landscapes, and his later "Sphinx" and "Prayers in the Desert," deserve mention. His pictures have commanded high prices since his death.

MULLET, *Mugil*, a genus of acanthopterous fishes, the type of the family *mugilidæ*. In this family, the body is nearly cylindrical, the scales are large; there are two widely separated dorsal fins the first of which has only four stiff, sharp spines; the teeth are extremely fine; the gullet is closed by an extraordinary development of the pharyngeal bones, so that only soft and thin food can pass down it; a branch of the stomach forms a kind of gizzard. The best-known of this family belong to the genus *mugil*, of which there are many species. They have a small mouth, with a fold or crest in the under lip, which fits into a corresponding notch in the upper one. The COMMON MULLET, or GRAY MULLET (*M. capito*), is found in the Mediterranean, and along the western shores of Europe, as far as the southern and south-eastern shores of England, but becomes rare further north. The common mullet is usually about 15 in. in length, but sometimes two feet. The color is steel gray on the back, with bluish and yellowish reflections; the belly silvery white; the flanks with six or eight longitudinal lines of rosy brown. It often ascends rivers, generally selecting soft or fat substances for food, and often seeking food by thrusting its mouth into the soft mud. It is most readily taken by a bait of the boiled entrails of fish, or cabbage boiled in broth. It is easily reared in ponds, and readily answers the call which usually summons it to be fed. It is highly esteemed for the table.—A very nearly allied species, also called GRAY MULLET (*M. cephalus*), a native of the Mediterranean, is distinguished by having the eyes half covered with an adipose membrane, and by a large triangular scale pointing backwards, just over the origin of each pectoral fin. It attains a larger size than the former species, sometimes 10 or 12 lbs. weight. It enters the mouths of rivers at certain seasons, and ascends into the fresh water. It is the most esteemed of all the mullets, and was in great request among the ancients. Enormous prices were given by the Romans for unusually large mullets, the price increasing, like that of diamonds, far more rapidly than the size. Mullets are used fresh, salted, and smoke-dried. A preparation of their roe, called *botarcha*, is in great esteem as a condiment in Italy and the s. of France. Mullets are often caught in the Mediterranean by angling from a rock, with a bait paste, when they have been previously attracted to the spot by macaroni thrown into the water. A third species of GRAY MULLET (*M. chelo*) is not unfrequent on the coasts of England, and even of Scotland. It is remarkable for its large fleshy lips. It swims in great shoals. In the Mediterranean it sometimes attains the weight of 8 lbs. The AMERICAN MULLET (*M. albula*) is very like the common mullet, but more slender, the tail large and forked. It abounds about the Bahama islands, and extends far northwards. It is highly esteemed for the table.

The name mullet is also given to the genus *mullus* of the family *percidæ*. See SURMULLET

MULLET, or MOLLET, in heraldry, is a charge in the form of a star, generally with five points, intended to represent a spur-rowel, and of frequent occurrence from the earliest beginnings of coat-armor. Gwillim, sir George Mackenzie, and Nisbet lay it down that mullets should always be pierced to represent the round hole in which the spur-rowel turns, but this has been by no means uniformly attended to in practice. Much confusion exists in blazonry between mullets and stars; in England the rule most generally adopted is that the mullet has five points, whereas the star has six, unless any other number be specified. Nisbet lays down a canon nearly the converse of this, which has never been adhered to; and in Scottish heraldry the same figure seems to be often blazoned as a mullet or a star, according as it accompanies military or celestial figures. The mullet is the mark of cadency assigned to the third son, "to incite him to chivalry." The word mullet is occasionally used in heraldry for the fish so called.

MULLIDÆ. See SURMULLET, *ante*.

MULLINGAR′, chief t. of the co. of Westmeath, in Ireland, is situated on the great western road from Dublin to Galway, distant from the former, with which it is connected by the Royal canal and the Midland Western railway, 50 m. n.n.w. Its pop., in 1871, was 5,108, of whom 4,090 were Roman catholics, 886 Protestants of the Episcopal church, the rest members of other denominations. It is the center of a poor-law union of forty-eight divisions, comprising an area of 208,401 acres. Mullingar is a place of little historical interest, although its immunities date from the reign of Elizabeth. Its public buildings are in no way remarkable, but it possesses several schools; among the number, one recently endowed for general educational purposes. It is without manufactures, but has considerable celebrity as the site of several of the most important horse and cattle fairs in Ireland.

MULLION, the upright division between the lights of windows, screens, etc., in Gothic architecture. Mullions are rarely met with in Norman architecture, but they become more frequent in the early English style, and in the decorated and perpendicular are very common. They have sometimes small shafts attached to them, which carry the tracery of the upper part of the windows. In late domestic architecture they are usually plain.

MULLINS, William, 1575–1621; b. in England, adopted the principles of the Puritans, and with them took refuge first in Holland and then in America. He was a man of wealth, had much influence in deciding upon the movements of the colonists, and was one of the signers of the celebrated compact drawn up on the *Mayflower*. The severe New England winter proved too much for his health and he died about six months after the landing at Plymouth rock; his wife and children soon followed him, with the exception of a daughter, Priscilla, the heroine of Longfellow's *Courtship of Miles Standish*; and from the marriage of John Alden and Priscilla Mullins are descended a number of eminent men of our own day.

MÜLLNER, Amadeus Gottfried Adolf, 1774-1829, b. in Saxony, took a degree in jurisprudence at Leipsic, and practiced law. He wrote a number of works on legal topics, and also novels and dramas. Two of his dramas, *Der Neunundzwanzigste Februar* and *Die Schuld*, were once very popular, but are now forgotten.

MULOCK, Dinah Maria. See Craik.

MULREADY, William, R. A., was b. at Ennis, in Ireland, about the year 1786. When a boy he went to London with his parents; at the age of fifteen entered as a student in the royal academy, and made good progress, aiming at first at the classic style, or what, according to the notions of the day, was called high art. Following the bent of his genius, however, he soon relinquished this course, and devoted himself to the study of nature and the works of those artists who attained high reputation in a less pretentious walk of art. His first pictures were landscapes of limited dimension and subject, views in Kensington gravel-pits, old houses at Lambeth, and interiors of cottages. He next essayed figure-subjects of incidents in every-day life, such as "A Roadside Inn," "Horses Baiting," the "Barber's Shop," and "Punch" (painted in 1812), "Boys Fishing" (1813), "Idle Boys" (1815). Mulready was elected an associate of the royal academy in Nov., 1815, and an academician in Feb., 1816; a strong proof of the high estimation in which his talents were held by his brethren, for the higher dignity is rarely conferred till after a probation of several years as associate. Even in his earliest time his works were characterized by much elaboration; but those he executed about the middle period of his career exhibit an extraordinary amount of finish and greater brilliancy of coloring, qualities that he carried further and further as he advanced in years; and though he lived to a great age (he died on July 7, 1863), he continued to work with undiminished powers till within a day of his death. A great number of Mulready's best works now belong to the public, as portions of the Vernon and Sheepshanks's collections. In the first-named there are four pictures, one of these, "The Last in, or Truant Boy," exhibited in 1835, being one of the most elaborate works of his middle period; while in the Sheepshanks' collection there are no fewer than twenty-eight of his works, among which, "First Love," exhibited in 1840, is a remarkable example of refinement in drawing, and delicacy of feeling and expression. "The Sonnet," exhibited in 1839, is perhaps his highest effort in point of style; and by "The Butt—Shooting a Cherry," exhibited in 1848, is best exemplified the remarkable minuteness of his finish and richness of his coloring. An edition of the *Vicar of Wakefield*, published in 1840, by Van Voorst, embellished with twenty wood-cuts from Mulready's drawings, is a very fine work. "Women Bathing" was exibited in 1849; and, in 1852, "Blackheath Park." "The Toy Seller," a large picture exhibited the year before he died, was unfinished, and not at all equal to earlier and smaller ones, but remarkable as the work of a man whose artistic efforts had been lauded sixty years before.

MULTAN', or *Mooltan*, an ancient and important city of India, in the Punjab, on a mound consisting of the ruins of ancient cities that occupied the same site, three miles from the left bank of the Chenab—the inundations of which sometimes reach Multan—and 200 m. s. w. of Lahore. It has railway communication with all the principal towns of India—Calcutta, Bombay, Madras, Peshawar, etc. The city is surrounded by a dilapidated wall, from forty to fifty ft. in height. The vicinity abounds in mosques, tombs, shrines, etc., attesting alike the antiquity and magnificence of the former cities; and the country around is remarkable for its fertility. Multan is a military station, with a small redoubt in the rear of the cantonment. Its bazaars are numerous, extensive, and well stocked; and its shops, 6,000 in number, are well supplied with European and Asiatic commodities. Manufactures of silks, cottons, shawls, scarfs, brocades, tissues, etc., are carried on, and there is an extensive banking trade. The merchants of Multan are proverbially esteemed extremely rich. Steamers ply between this city and Hyderabad, a distance of 570 m.; and the Indus Valley railway opens up a commercial outlet from central Asia, the Punjab, and the North-West provinces, to the Arabian sea by Hyderabad and Karachi. In 1849 Multan was taken by the British troops under gen. Whish, and annexed with its territory to the British possessions. The pop. of Multan in 1868 was 56,826.

MULTIPLE-POINDING is a well-known form of action in Scotland, by which competing claims to one and the same fund are set at rest. It means double poinding or double distress, suggesting that a person who has funds in his possession is liable to be harassed by double distress; and hence he commences a suit called the action of multiplepoinding, by which he alleges that he ought not to be made to pay the sum more than once; and as he does not know who is really entitled to payment, he cites all the parties claiming it, so that they may fight out their claims among themselves. The suit corresponds to what is known in England as a bill or order of interpleader.

MULTIPLICA'TION, the third and most important of the four principal processes of arithmetic, is a compendious mode of addition, when a number is to added to itself a given number of times. The three terms of a multiplication are the *multiplicand*, or number to be multiplied; the *multiplier*, or number by which it is to be multiplied; and the *product*, giving the amount which would be obtained if the multiplicand were added to itself the number of times denoted by the multiplier. The symbol of multiplication is ×; and in arithmetic the numbers are placed above each other as in addition, with a line drawn under them; in algebra the quantities are merely placed side by side, with or without a dot between them—e.g., the multiplication of 2 by 4 may be written 2×4, and of a by b, $a \times b$, $a.b$, or ab. For multiplication of fractions, see FRACTIONS.

The operation of multiplication has been much abbreviated by the use of logarithms (q.v.), and has been rendered a mere mechanical process, by the invention of Napier's bones, the sliding rule, Gunter's scale, etc.

MULTIVALVE SHELLS, or MULTIVALVES, are those shelly coverings of mollusks which are formed of more than two distinct pieces. In systems of conchology (q.v.) the term is one of primary importance; but since the study of the living animals has led to arrangements very different from those founded on their mere shells, a very subordinate place has been assigned to it, as indicating a distinction much less important than was at first supposed. Thus chitons (q.v.), which have multivalve shells, are now placed in the same order of gasteropods with limpets (q.v.) of which the shells are univalve; and *pholas* (q.v.) and *teredo* (q.v.), which have two principal valves and some small accessory valves, the latter also a long shelly tube, are placed among lamellibranchiate mollusks, along with most of the bivalves of conchologists. In conchological systems, barnacles and acorn-shells were also generally included, and ranked among multivalves; but these are now no longer referred even to the same division of the animal kingdom. See CIRRHOPODA.

MULTNOMAH, a co. in n.w. Oregon; drained by the Willamette and Columbia rivers, the latter being its n. boundary; traversed by the Oregon Central and Oregon and California railroads; about 400 sq.m.; pop. '80, 25,201—17,269 of American birth. The surface is nearly level and is covered by forests, lumber being the chief product. Co. seat, Portland.

MUL'TURES, in Scotch law, mean a quantity of grain either manufactured or in kind deliverable to the proprietor or tacksman of a mill for grinding the corn sent there. Some persons living in the neighborhood are bound to send their corn to be ground at a particular mill, in which case the lands are said to be astricted to the mill, and form the thirl or suken, and the tenants or proprietors of the lands are called insucken multurers. Those who are not bound to go to the mill are called outsucken multurers. Thirlage is thus classed among servitudes, being a kind of burden on the lands. Such a right is unknown in England, except sometimes in old manors.

MUM, a peculiar kind of beer, formerly used in this country, and still used in Germany, especially in Brunswick, where it may be almost regarded as the national drink. Instead of only malt being used, it is made of malt and wheat, to which some brewers add oats and bean-meal. It is neither so wholesome nor so agreeable as the common ale or beer.

MUMMIUS, LUCIUS, about B.C. 185–130; a Roman of plebeian birth; first spoken of as a prætor in the province of farther Spain, where he met with some, but not very great military success. In 146 he was elected consul and placed in command of the Achæan war. The first battle was decisive. It was fought near Corinth and resulted in the complete defeat of the Grecian allies. The surname of Achaiacus was given to Mummius, and a triumph was decreed a second time. The cities of Corinth, Thebes, and Chalcis were plundered and then destroyed by the Roman troops. As trophies of his victory, Mummius caused many of the most valuable works of art to be sent to Rome; and it is related of him, as illustrating his dense ignorance in everything not pertaining to military matters, that he insisted that, if those who were to convey the pictures and statues should break or lose any, they should *replace them by new ones.* Cicero speaks of him as a blunt and plain but honest man, and says that, of all his enormous plunder, none was reserved for his own use. In 141 he was again elected consul, and it was then that the capitol was gilded for the first time. Nothing is known certainly about his later life and his death, some writers saying that he died in exile at Delos, and others that his death occurred in Rome, and that his daughter received a dowry from the senate.

MUMMY. See EMBALMING.

MUMMY-WHEAT is said to be a variety of wheat produced from grains found in an Egyptian mummy. But no good evidence of this origin has been adduced—in fact it is as good as proved to be impossible; and the same variety has long been in general cultivation in Egypt and neighboring countries. The spike is compound—a distinguishing character, by which it is readily known, but which is not altogether permanent. It is occasionally cultivated in Britain, but seems more suitable to warmer regions.

MUMPS, The, is a popular name of a specific inflammation of the salivary glands described by nosologists as *cynanche parotidæaor* or *parotitis.* In Scotland it is frequently termed *the branks.*

The disorder usually begins with a feeling of stiffness about the jaws, which is followed by pains, heat, and swelling beneath the ear. The swelling begins in the parotid, but the other salivary glands (q.v.) usually soon become implicated, so that the swelling extends along the neck toward the chin, thus giving the patient a deformed and somewhat grotesque appearance. One or both sides may be affected, and, in general, the disease appears first on one side and then on the other. There is seldom much fever. The inflammation is usually at its highest point in three or four days, after which it begins to decline, suppuration of the glands scarcely ever occurring. In most cases no treatment further than antiphlogistic regimen, due attention to the bowels, and protection of the parts from cold, by the application of flannel or cotton-wool, is required, and the patient completely recovers in eight or ten days.

The disease often originates from epidemic or endemic influences, but there can be no doubt that it spreads by contagion; and, like most contagious diseases, it seldom affects the same person twice. It chiefly attacks children and young persons.

A singular circumstance connected with the disease is, that in many cases the subsidence of the swelling is immediately followed by swelling and pain in the *testes* in the male sex, and in the *mammæ* in the female. The inflammation in these glands is seldom very painful or long continued, but occasionally the inflammation is transferred from these organs to the brain, when a comparatively trifling disorder is converted into a most perilous disease.

MÜNCHHAUSEN, Karl Friedrich Hieronymus, Baron von, a member of an ancient and noble German family, who attained a remarkable celebrity by false and ridiculously exaggerated tales of his exploits and adventures so that his name has become proverbial. He was b. in 1720 at the family estate of Bodenwerder, in Hanover, served as a cavalry officer in the Russian campaigns against the Turks in 1737–39, and died in 1797. A collection of his marvelous stories was first published in England under the title of *Baron Münchhausen's Narrative of his Marvelous Travels and Campaigns in Russia* (Lond. 1785). The compiler was one Rudolf Erich Raspe, an expatriated countryman of the baron's. A second edition appeared at Oxford (1786) under the title of *The Singular Travels, Campaigns, Voyages, and Sporting Adventures of Baron Munnikhousen, commonly pronounced Munchausen; as he relates them over a bottle when surrounded by his friends.* Several other editions rapidly followed. In the same year (1786) appeared the first German edition, edited by the poet Bürger; the latest—entitled *Des Freiherrn von Münchhausen wunderbares Reisen und Abenteuer* (1849 and 1855)—is enriched by an admirable introduction by Adolf Ellisen, on the origin and sources of the famous book, and on the kind of literary fiction to which it belongs. Ellisen's father knew the splendid old braggart in his latter days, and used to visit him. Nevertheless, although Raspe may have derived many of his narratives from Münchhausen himself, he appears to have drawn pretty largely from other sources. Several of the adventures ascribed to the baron are to be found in older books, particularly in Bebel's *Facetiæ* (Strasb. 1508); others in Castiglione's *Cortegiano*, and Bildermann's *Utopia*, which are included in Lange's *Deliciæ Academicæ* (Heilbronn, 1765). Münchhausen's stories still retain their popularity, especially with the young.

MUNCH, Andreas, b. Norway, 1810; studied jurisprudence at Christiania, in the library of whose university he was employed as an amanuensis from 1830 to 1860. He published *Poems, Old and New*, in 1848, and *New Poems* in 1850. His dramas, *Salomon de Caus*, 1845, and *Lord William Russell*, 1857, were well received. He was pensioned by the government in 1860.

MUNCH, Peder Andreas, 1810–63; b. Norway, educated at Skien and at the university of Christiania, where he took a degree in jurisprudence. Preferring the study of languages and history to law, he became professor of history at Christiania. In 186 he was appointed historiographer and archivist of Norway. His favorite studies were the ancient history and languages of Scandinavia, on which he propounded some novel theories. He maintained that three distinct dialects prevailed in the kingdoms of Norway, Sweden, and Denmark, and that the so-called Icelandic literature was really the production of ancient Norway. He held that the modern Icelanders keep one dialect and the inhabitants of the Färoe islands another of the ancient Norwegian. He rejected the term "Icelandic," for which he substituted "old Norwegian." He was a bitter opponent of "Scandinavism," or the union of Norway, Sweden, and Denmark in one kingdom. He published an *Old Norwegian Grammar*, an *Old Norwegian Reading Book*, and a *History of Norway, Sweden, and Denmark*, and edited a number of Icelandic works, including the elder *Edda* and the *Royal Mirror*.

MÜNCH-BELLINGHAUSEN, Eligius Franz Joseph von, Baron, 1806–71; b. Cracow; studied jurisprudence, and held a number of government offices in Austria. His first play, *Griseldis*, was produced at the Burg theater in Vienna, of which he was afterward director, in 1834, and was well received. It was followed by *The Adept*, 1836;

Camoens, 1837; *Imelda Lamberdazzi*, 1838; and the *Son of the Wilderness*, 1843, well known on the American stage under the name of *Ingomar*. *Maria de Molina* appeared in 1847, and *The Gladiator from Ravenna*, his greatest work, in 1854. He published also a volume of verses. He wrote under the pseudonym of "Friedrich Halm."

MÜNCHEN-GLADBACK, a t. in Rhenish Prussia, 16 m. by rail, w. by s. of Düsseldorf. It has large manufactures of linen and damask cloths. Pop. 31,970.

MUNDT, KLARA (MÜLLER,) 1814–73; her father, aulic councilor of Neubrandenburg, gave her an excellent education which rapidly developed the powers of her mind and turned her attention to the study of serious subjects. She was married in 1839 to the radical writer Theodor Mundt, whose advanced opinions in regard to the emancipation of women, etc., she adopted. She began her literary career under the pseudonym of Louise Mühlbach, and published a large number of romances abounding in startling situations, in which poison and the stiletto play a principal part. She is best known by her historical novels, which have all been translated into English, and are distinguished rather for their brilliancy than for their accuracy. Among them are *Joseph II. and his Court; Frederick the Great and his family; Marie Antoinette and her son; Queen Hortense; Goethe and Schiller;* and *Napoleon and Blucher.*

MUNCIE, co. seat of Delaware co., Ind.; on the w. fork of the White river, at the junction of the Cleveland, Columbus, Cincinnati, and Indianapolis, and the Fort Wayne, Muncie, and Cincinnati railroads; 54 m. n.e. of Indianapolis by rail; pop. 4,515. It has a good local business. The town has 9 churches, a court house, a city hall, banks, newspapers, good schools, a public library, and two or three foundries and factories.

MUNDT THEODOR, 1808–61; b. Germany; educated at the universities of Berlin and Leipsic. He took an active interest in public affairs, and identified himself with that party of rising authors, journalists, and politicians, known as "Young Germany." His political views brought him into disfavor with the government, and he left Germany, and made a European tour. On his return he was permitted to become a member of the teaching body of the university of Berlin, and in 1848, he was appointed to the chair of history at Breslau. Two years later he was made director of the Berlin university library. The first of his works to attract attention, was *Madonna, or Conversations with a Saint*, a powerful but unwholesome book, which is said to have induced Charlotte Stieglitz to kill herself out of affection for her husband. Her works were collected and published by Mundt in 1835. After the publication of a number of books of travel, he wrote a series of historical or romantic novels, of which the most successful were: *Carmola, or the Anabaptists*, 1844; *Mendoza, or the Arch-scoundrel*, 1847; and *The Matadores*, 1850. He edited in conjunction with Varnhagen von Ense, the posthumous works of Knebel, and prepared an edition of the political writings of Luther. He also wrote a *History of Society*, *History of Contemporary Literature*, and a universal literary *History*. He married the novelist, Klara Muller.

MUN'DANE EGG. In many heathen cosmogonies, the world (Lat. *mundus*) is represented as evolved from an egg. The production of a young animal from what neither resembles it in form nor in properties, seems to have been regarded as affording a good figure of the production of a well-ordered world out of chaos. Thus, in the Egyptian, Hindu, and Japanese systems, the Creator is represented as producing an egg, from which the world was produced. The same notion is found, in variously modified forms, in the religions of many of the ruder heathen nations. Sometimes a bird is represented as depositing the egg on the primordial waters. There are other modifications of this notion or belief in the classical and other mythologies, according to which the inhabitants of the world, or some of the gods, or the powers of good and evil, are represented as produced from eggs. The egg appears also in some mythological systems as the symbol of reproduction or renovation, as well as of creation. The Mundane Egg belonged to the ancient Phœnician system, and an egg is said to have been an object of worship.

MUNGO, SAINT, the popular name of St. Kentigern, one of the three great missionaries of the Christian faith in Scotland. St. Ninian (q.v.) converted the tribes of the s.; St. Columba (q.v.) was the apostle of the w. and the n.; St. Kentigern restored or established the religion of the Welsh or British people, who held the country between the Clyde on the n., and the furthest boundaries of Cumberland on the s. (see BRETTS AND SCOTS). He is said to have been the son of a British prince, Owen ab Urien Rheged, and of a British princess, Dwynwen or Thenaw, the daughter of Llewddyn Lueddog of Dinas Eiddyn, or Edinburgh. He was born about the year 514, it is believed at Culross, on the Forth, the site of a monastery then ruled by St. Serf, of whom St. Kentigern became the favorite disciple. It is said, indeed, that he was so generally beloved by the monastic brethren, that his baptismal name of Kentigern or Cyndeyrn, signifying "chief lord," was exchanged in common speech for Mungo, signifying "loveable" or "dear friend." Leaving Culross, he planted a monastery at a place then called Cathures, now known as Glasgow, and became the bishop of the kingdom of Cumbria (q.v.). The nation would seem to have been only partially converted, and the accession of a new king drove St. Kentigern from the realm. He found refuge among the kindred people of Wales, and there, upon the banks of another Clyde, he founded another monastery and bishopric, which still bears the name of his disciple, St. Asaph. Recalled to Glasgow by a new king, Rydderech or Roderick the bountiful, Kentigern renewed his missionary labors, in which he was cheered by a visit from St. Columba, and dying about the year 601, was buried where the cathedral of Glasgow now stands. His life has been often written. A fragment of a memoir, composed at the desire of Herbert, bishop of Glasgow, between 1147 and 1164, has been printed by Mr. Cosmo Innes in the *Registrum Episcopatus Glasguensis*. The longer life by Joceline of Furness, written about 1180, was published by Pinkerton in his *Vitæ Antiquæ Sanctorum Scotiæ*. It appeals to two still older lives. The fame of St. Kentigern is attested by the many churches which still bear his name, as well in Scotland as in the n. of England. The church of Crosthwaite, where Southey is buried, is dedicated to him. The miracles which he was believed to have wrought were so deeply rooted in the popular mind, that some of them sprung up again in the 18th c. to grace the legends of the Cameronian martyrs. Others are still commemorated by the armorial ensigns of the city of Glasgow—a hazel-tree whose frozen branches he kindled into a flame, a tame robin which he restored to life, a hand-bell which he brought from Rome, a salmon which rescued from the depths of the Clyde the lost ring of the frail queen of Cadyow. Nor is it St. Mungo only whose memory survives at Glasgow; the parish church of "St. Enoch" commemorates his mother, St. Thenaw; and it is not many years since a neighboring spring, which still bears her name, ceased to be an object of occasional pilgrimage.

MUNI, a Sanskrit title, denoting a holy sage, and applied to a great number of distinguished personages, supposed to have acquired, by dint of austerities, more or less divine faculties.

MUNICH (Ger. *München*), the capital of Bavaria, is situated in 48° 8′ n. lat., and 11° 35′ e. long., in the midst of a barren and flat elevated plain, at a height of about 1700 ft. above the level of the sea. Pop. '71, 169,478, about 90 per cent. being Roman Catholics, 9 per cent. Protestants, and 1 per cent Jews; '75, 193,024. Munich lies on the left bank of the Iser, and consists, in addition to the old town, of five surburbs, and of the three contiguous districts of Au, Haidhausen, and Obergiesing. By the efforts of king Ludwig I., who spent nearly 7,000,000 thalers on the improvements of the city, Munich has been decorated with buildings of almost every style of architecture, and enriched with a larger and more valuable collection of art-treasures than any other city of Germany. It possesses 42 churches, of which all but two or three are Catholic, and of these, the most worthy of note are: the cathedral, which is the see for the archbishopric of Munich-Freising, built between 1468-94, and remarkable for its two square towers, with their octagonal upper stories, capped by cupolas, and its 30 lofty and highly-decorated windows; the church of the Jesuits, or St. Michael's, which contains a monument by Thorwaldsen to Eugene Beauharnais; the Theatiner Kirche, completed in 1767, and containing the burying-vaults of the royal family; the beautiful modern church of St. Mariahilf, with its gorgeous painted glass and exquisite wood-carvings; the round church, or Basilica of St. Boniface, with its dome resting on 64 monoliths of grey Tyrolean marble, and resplendent with gold, frescoes, and noble works of art; the cruciform-shaped Ludwig Kirche, embellished with Cornelius's fresco of the Last Judgment; and lastly, the Court Chapel of All Saints, a perfect casket of art-treasures. Among the other numerous public buildings, a description of which would fill a volume, we can only briefly refer to a few of the more notable; as the theater, the largest in Germany, and capable of accommodating 2,400 spectators; the post-office; the Ruhmes-halle; the new palace, including the older royal residence, the treasury and chapel, antiquarian collections, etc.; and the Königsbau, designed by Klenze in imitation of the Pitti palace, and built at a cost of 1,250,000 thalers, containing J. Schnorr's frescoes of the Nibelungen; the banqueting halls, rich in sculpture by Schwanthaler, and in grand fresco and other paintings. In the still incomplete suburb of Maximilian are situated the old Pinakothek, or picture-gallery, erected in 1836 by Klenze, containing 300,000 engravings, 9,000 drawings, a collection of Etruscan remains, etc.; and immediately opposite to it, the new Pinakothek, completed in 1853, and devoted to the works of recent artists; the Glyptothek, with its 12 galleries of ancient sculpture, and its noble collection of the works of the great modern sculptors, as Canova, Thorwaldsen, Schadow, etc. Among the gates of Munich, the most beautiful are the Siegesthor ("The Gate of Victory"), designed after Constantine's triumphal arch in the Forum, and the Isarthor with its elaborate frescoes. In addition to these and many other buildings intended either solely for the adornment of the city, or to serve as depositories for works of art, Munich possesses numerous scientific, literary, and benevolent institutions, alike remarkable for the architectural and artistic beauty of their external appearance, and the liberal spirit which characterizes their internal organization. The library, which is enriched by the biblical treasures of numerous suppressed monasteries, contains about 800,000 volumes, of which 1300 are incunabula, with nearly 22,000 MSS. The university, with which that of Landshut was incorporated in 1826, and now known as the Ludwig-Maximilian university, comprises 5 faculties, with a staff of 116 professors and teachers. In 1876 the number of matriculated students attending the university was 1203. In association with it are numerous medical and other schools, a library containing 200,000 volumes, and various museums and cabinets.

Munich has an ably-conducted observatory, supplied with first-rate instruments by

Fraunhofer and Reichenbach; 3 gymnasia, 4 Latin, 1 normal, various military, professional, polytechnic, and parish schools, of which the majority are Catholic; institutions for the blind, deaf and dumb, and crippled, and for female orphans, besides numerous hospitals, asylums, infant schools, etc.; an academy of sciences; royal academies of painting, sculpture, music, etc.; a botanic garden, parks, public walks, and gardens adorned with historic, patriotic, and other monuments, and designed for the celebration of annual and other national fairs and festivals; spacious cemeteries, etc. Munich is mainly indebted to Ludwig I. for its celebrity as a seat of the fine arts, as the greater number of the buildings for which it is now famed were erected between 1820 and 1850, although, under his successors, Maximilian II., and Ludwig II. (ascended the throne in 1864), the progress of the embellishments of the city has been continued on an equally liberal scale. Munich is somewhat behind many lesser towns of Germany in regard to literary advancement and freedom of speculation, while its industrial activity is also inferior to its state of high artistic development. It has, however, some eminently good iron, bronze, and bell foundries, and is famed for its lithographers and engravers, and its optical, mathematical, and mechanical instrument-makers, amongst whom Utzschneider, Fraunhofer, and Ertl have acquired a world-wide renown. Munich is noted for its enormous breweries of *Bavarian beer;* and has some good manufactories for cotton, wool, and damask goods, wax-cloth, leather, paper-hangings, carriages, pianos, gold, silver, and steel wares, etc.

The present name of this city cannot be traced further than the 12th c., when Henry the lion raised the *Ville Munichen* from its previous obscurity by establishing a mint within its precincts, and making it the chief emporium for the salt which was obtained from Halle and the neighboring districts. In the 13th c. the dukes of the Wittelsbach dynasty selected Munich for their residence, built the Ludwigsburg, some parts of whose original structure still exist, and surrounded the town with walls and other fortified defenses. In 1327 the old town was nearly destroyed by fire, and rebuilt by the emperor Ludwig of Bavaria, very much on the plan which it still exhibits; but it was not till the close of last century, when the fortifications were razed to the ground, that the limits of the town were enlarged to any extent. The last fifty years, indeed, comprise the true history of Munich, since within that period all its finest buildings have been erected, its character as a focus of artistic activity has been developed, its population has been more than doubled, and its material prosperity augmented in a proportionate degree.

MUNICIPAL ARCHITECTURE, the style of the buildings used for municipal purposes, such as town-halls, guild-halls, etc. These were first used when the towns of the middle ages rose in importance, and asserted their freedom. Those of north Italy and Belgium were the first to move, and consequently we find in these countries the earliest and most important specimens of municipal architecture during the middle ages. It is only in the "free cities" of that epoch that town-halls are found. We therefore look for them in vain in France or England till the development of industry and knowledge had made the citizens of the large towns so wealthy and important as to enable them to raise the municipal power into an institution. When this became the case, in the 15th and 16th centuries, we find in these countries abundant instances of buildings erected for the use of the guilds and corporations and the municipal courts. Many of these still exist along with the corporate bodies they belong to, especially in London, where the halls are frequently of great magnificence. Many of these corporation halls have recently been rebuilt by the wealthy bodies they belong to, such as the fish-mongers, merchant tailors, goldsmiths, and other companies. Municipal buildings on a large scale for the use of the town councils and magistrates have also been recently erected in many of our large towns, which had quite out-grown their original modest buildings; and now no town of importance is complete without a great town-hall for the use of the inhabitants.

Municipal buildings always partake of the character of the architecture of the period when they are erected; thus we find in Italy that they are in the Italian-Gothic style in Como, Padua, Vicenza, Venice, Florence, etc., during the 13th, 14th, and 15th centuries. In Belgium, during the same period, they are of the northern Gothic style, and are almost the only really fine specimens of the civil architecture of the middle ages we possess. The cloth-hall at Ypres, and the town-halls of Brussels, Louvain, Bruges, Oudenarde, etc., the exchange at Antwerp, and many other markets, lodges, halls, etc., testify to the early importance of the municipal institutions in Belgium.

It is a curious fact that in France, where the towns became of considerable importance during the middle ages, so few municipal buildings remain. This arises from the circumstance that the resources of the early municipalities of France were devoted to aid the bishops in the erection of the great French cathedrals, and the townspeople used these cathedrals as their halls of assembly, and even for such purposes as masques and amusement.

Of the English corporation halls, those which remain are nearly all subsequent to the 14th c., from which time to the present there are very many examples. The guild-hall of London is one of the earliest. The present building was begun in 1411, and was built chiefly by contributions from the trades "companies" of London. Of the town-halls recently erected, those of Manchester, Liverpool, and Leeds are amongst the most important.

MUNICIPALITY, MUNICIPAL CORPORATION (from Lat. *municeps*, from *munus* and *capio*, one who enjoys the rights of a free citizen), a town or city possessed of certain privileges of local self-government; the governing body in such a town. Municipal institutions originated in the times of the Roman empire. The provincial towns of Italy, which were from the first Roman colonies, as also those which, after having an independent existence, became members of the Roman state, though subjected to the rule of an imperial governor, were allowed to enjoy the right of regulating their internal affairs. A class of the inhabitants called the *curia*, or *decuriones*, elected two officers called *duumviri*, whose functions were supposed to be analogous to those of the consuls of the imperial city, and who exercised a limited jurisdiction, civil and criminal. There was an important functionary in every municipality called the *defensor civitatis*, or advocate for the city, the protector of the citizens against arbitrary acts on the part of the imperial governor. In the later ages of the empire, the decuriones were subject to heavy burdens; not compensated by the honor of the position, which led many to endeavor to shun the office. The municipal system declined with the decline of the empire, yet it retained vitality enough to be afterwards resuscitated in union with feudalism, and with the Saxon institutions of Britain. Some cities of Italy, France, and Germany have indeed derived their present magistracy by direct succession from the days of imperial Rome, as is notably the case with Cologne. The bishop, being a shield between the conquerors and the conquered, in many cases discharged the duties or obtained the functions of the *defensor civitatis*. To the north of the Alps, under the feudal system, he became officially the civil governor of the city, as the count was of the rural district. In southern Europe, where feudalism was less vigorous, the municipalities retained a large share of freedom and self-government.

Of the cities of the middle ages, some were entirely free; they had, like the provincial towns of Italy before the extension of the Roman conquests, a constitution independent of any other powers. Venice, Genoa, Florence, Hamburg, and Lübeck all stood in this position. Next in dignity were the free imperial cities in Germany, which, not being comprehended in the dominions of any of the princes, were in immediate dependence on the empire. Most of these cities rose into importance in the 13th c.; and their liberties and privileges were fostered by the Franconian emperors, to afford some counterpoise to the growing power of the immediate nobility. Nuremberg was especially celebrated for its stout resistance to the house of Brandenburg, and the successful war which it waged with the Franconian nobility. In England the more important cities were immediate vassals of the crown; the smaller municipalities sometimes owned a subject superior, sometimes a greater municipality for their overlord.

Under the Anglo-Saxons, the English burghs were subject to the rule of an elective officer called the "portreve," who exercised in the burgh functions similar to those of the shire-reve in the shire. The Norman conquerors recognized the already existing privileges of the towns by granting them charters. Instead of a shire-reve, a viscount was placed by the king over each shire, and a bailiff instead of the former elective officer over each burgh. In the larger towns, the bailiff was allowed to assume the Norman appellation of mayor. The municipal franchise seems to have been vested in all the resident and trading inhabitants, who shared in the payment of the local taxes, and performance of local duties. Titles to freedom were also recognized on the grounds of birth, apprenticeship, marriage, and sometimes free gift.

In all the larger towns, the trading population came to be divided into guilds or trading companies, through membership of which companies admission was obtained to the franchise. Eventually the whole community was enrolled in one or other of the guilds, each of which had its property, its by-laws, and its common hall, and the community elected the chief officers. It was on the wealthier and more influential inhabitants that municipal offices were generally conferred; and the practice gradually gained ground of these functionaries perpetuating their authority without appealing to the popular suffrage. Contentions and disputes arose regarding the right of election, and eventually the crown threw the weight of its influence into the scale of self-elective ruling bodies. As the greater municipalities grew in strength, we find their right recognized to appear in parliament by means of representatives. The sheriffs were considered to have a discretionary power to determine which towns should, and which should not have this privilege of representation. The sovereigns of the house of Tudor and Stuart acquired the habit of extending the right of parliamentary representation to burghs not in the enjoyment of it, while at the same time, by granting or renewing to them municipal charters, they modeled the constitution of these burghs to a self-elective type, and restricted the right of voting in the choice of a representative to the governing body. During the reign of William III., Anne, and the earlier Georges, the influence of the crown was largely employed in calling new municipal corporations into existence, with the view of creating additional parliamentary support for the ministry in power. The burghs of Scotland had a history much like that of the burghs of England; their earlier charters were mere recognitions of already existing rights, and were granted to the inhabitants at large. In the course of the 14th and 15th centuries, the municipal suffrage fell gradually more and more into the hands of restricted bodies of men, until act 1469. c. 5, gave to the councils the right of appointing their successors, the old and new council together electing the office-bearers of the corporation. This state of things continued till 1833, not without much complaint. In the Scottish burghs, the several trades possessed a much more exclusive monopoly than in England. Along with the outcry for parliamentary reform arose an outcry for municipal reform; and a separate municipal reform act putting an end to the close system was passed for each part of the empire. The English act (5 and 6 William IV. c. 76), entitled "An act to provide for the regulation of municipal corporations in England," conferred the franchise on the owners and occupiers of property within the burgh, with certain qualifications as to property, residence, etc. This constituency elected the councilors, and from the body of the councilors the mayor and aldermen were chosen. Act 32 and 33 Vict. c. 55, limited the requisite period of residence to one year's occupation, and the ballot was introduced by 35 and 36 Vict. c. 33, in municipal as in parliamentary elections. Act 3 and 4 William IV. made an entire change in the mode of electing councils in Scottish burghs which already had a council, and conferred councils on burghs which had none. A vote was given to every one who had resided six months in the burgh, or within seven of miles of it, and possessed the requisite qualification to exercise the parliamentary franchise: a property qualification similar to what conferred the parliamentary franchise being required in burghs that did not send or contribute to send a member to parliament. The municipal elections amendment act (Scotland) 1868, has placed the municipal franchise in the hands of all registered voters to return a member of parliament, and in the case of burghs not represented in parliament, in the hands of all persons possessing similar property qualifications: and act 33 and 34 Vict. c. 92 has provided for the establishment of a municipal register in burghs not represented in parliament. An exemption, under 3 and 4 William IV. c. 76, of nine small burghs from the operation of the new system has been done away with. Town-councilors must be electors residing in or carrying on business in the burgh. They remain in office three years, and elect from their number the provost and bailies. The English act of William IV. abolished the exclusive privileges of the guilds, but these monopolies continued in Scotland till 1839, when they were swept away by 9 and 10 Vict. c. 17. The Irish municipal system, which had been imported ready-made from England, was assimilated to the altered English system by 3 and 4 Vict. c. 108.

MUNICIPALITY—MUNICIPAL CORPORATION (*ante*), for the management of the affairs of a town or city. Municipal corporations, in the United States, are public corporations established by law for political purposes, and chiefly to exercise local and subordinate powers of legislation for the town or district incorporated. The corporation is not the body of the people, nor is it the officers collectively considered, but rather that legal entity created by the act of incorporation and limited thereby. Distinction must be made between a municipal corporation proper and what are known as *quasi* corporations not created by the motion of the people of the district, but rather as territorial or political divisions of the state, such as counties, and the peculiar New England townships, which are examples of almost pure democracy. The laws regulating the incorporation of English towns and cities have little application to municipal corporations in this country. Here none are founded on common law or royal charter, and but few are based upon prescription. It may be said that they exist only by legislative enactment, and possess no powers not created by the statute. The majority of municipal corporations are created by charter singly, but *general laws* of incorporation have been passed in many states, as Ohio, Iowa, Pennsylvania, Indiana, Missouri, Tennessee, and North Carolina. When the incorporation is single or special, the charter sets out that the inhabitants are constituted a body politic with such a name and style; that by that name they may have perpetual succession, and may use a common seal, sue and be sued, etc. The territorial boundaries are defined and provision made as to the form of government—usually by a council made up of aldermen and councilmen, or by trustees—as to division into wards, qualifications of voters, powers of city council to collect debts and lay taxes, etc. General laws of municipal incorporation as in the states above mentioned, usually start by abolishing all special charters existing, and establish general regulations for the incorporation, government, and regulation of municipal corporations throughout the state. Frequently such laws classify the towns to be incorporated as regards their importance into cities of first or second grade, towns, and villages. To become operative the charter granted by the legislature must be accepted by the body of citizens to be incorporated. Provisions sometimes exist in the constitutions of the states limiting the power of the legislature in granting powers and privileges to towns and cities.

When established, the municipal corporation is not beyond the power of the legislature; thus it has been held that the latter may repeal charter provisions, allowing the licensing of liquor dealers, and even such as relate to police regulations. In other words, the town has no *vested right* in its charter privileges, and they may always be altered or revoked with the important exception that the rights of existing and constitutional creditors must not be disregarded. In the celebrated Dartmouth college case it was strongly intimated from the bench that the legislature could not revoke a grant to municipal corporations in *fee simple*. But the legislature has general control over public property, and may authorize a railroad to occupy the streets of a city, without payment therefor. No exact form of words is necessary to give force to the charter, and the corporations may even be created by implication. The charter may be amended or repealed by either general or special law. The powers given to the municipality are those expressly stated in the charter, such as may fairly be implied therefrom, and such as are essential to the carrying out of the purpose for which the body is created. Where the city is given a discretion upon any point it is not for the courts to say whether such discretion has or has not been wisely used. Thus, if it have power to open new streets or grade old ones when necessary for the welfare of the city, the question of necessity is one for the determination of its own governing body. It has been fully decided that taxes and public funds cannot be seized under execution or by writ of garnishment. *Salus populi suprema lex.*

Among the leading powers of a municipal corporation are the rights of taxation, of eminent domain appointing officers, enacting ordinances, and instituting actions. Many special powers are given as to borrowing money, police regulations, wharves, ferries, giving aid to railroads, entertaining guests, etc. That in all these and other powers the corporation may act freely when there is special enactment in the charter or general law is not a matter of doubt. But how far may they extend their operations without such authority and under a general clause empowering them to act for the *general welfare* of the city? The power to become indebted is often specially limited. The doctrine that cities may aid railroads by the purchase of bonds or otherwise was established by the U. S. supreme court in *Olcott* vs. *Supervisors* (1873), on the ground that railroads are *publici juris*. The power to borrow money is implied when necessary to the ends for which the corporation exists. It seems to be the doctrine that the corporate existence can cease only by act of legislature, that is, that the municipality cannot voluntarily surrender its privileges. *Amotion* is the removal of an agent or officer of a corporation before his term is expired, and must be for cause, which, however, may be for other than official dereliction, as for infamous private character. The city government may regulate local elections so as to preserve purity of the ballot without special authority; special tribunals to decide contests are often established by the charter, and courts of law may inquire into the proceedings by writs of *quo warranto* or *mandamus*, unless the legislature has denied such right. As to legal liability, an officer improperly removed may bring suit for damages against the corporations; but the city or town cannot have an action against an officer or agent for damage resulting from an honest mistake on his part.

Corporate meetings are usually provided for by charter, but may be regulated by ordinance. In the peculiar New England township system the meeting is actually an assembly of the whole body of inhabitants; though even there in large cities these meetings are necessarily mere formalities; and in many places true municipal corporations have control over the same territory. Elsewhere the representative system prevails. Notice of time and place of meeting should be given, and it is customary to state the nature of matters to be discussed. Ordinances may be declared void by the legislature if oppressive or in restraint (not regulation) of trade. Of course, if power to enact law is given, power to punish is implied, usually by fine; and it has been held that there is no power of imprisonment except by statutory provision; yet the power of appeal from a municipal to a higher court has been held to satisfy the constitutional right of the citizen to a trial before a jury. Strangers are bound by local ordinances.

The powers of the municipality under a "general welfare" clause are to be interpreted very liberally when the health, peace, or safety of a city are at stake. Contracts may be entered into under the express or implied authority of the statute. Parties contracting with a public corporation are bound to find out the true powers of the latter, and the scope of an agent's authority; but an unathorized contract may be accepted by ratification. Payment is usually by warrant on the treasurer, and if, after being cashed by the latter, the warrant is again put on the market, even though by a regular officer of the city, it is worthless, though in the hands of an innocent third party. Municipal corporations have large powers as to acquiring and disposing of property; conveyance must be under corporate name and seal, a vote in council not passing title. As to the right of eminent domain, most important questions have arisen, and the lines of power are not yet clearly drawn. The constitution of the United States provides that private property shall not be taken for public use except upon just compensation, but manifestly the raising of taxes and the destruction of property under necessary police powers do not come under this head. The rule is that the purpose for which property is taken must be useful, as in water-works, sewers, etc., and not merely ornamental. But public parks have been held necessary to the health and well-being of a city, and the right of eminent domain has been allowed. Proper notice must be given. Unjust assessment of damages may be brought before a court by writ of *certiorari*. The damages are usually assessed by commissioners; in New York by "a jury, or not less than three commissioners appointed by a court of record." It has been held that the power of legislatures to place railroads in public streets may be delegated to municipal authorities. In assessment for street improvements it is very common to equalize the benefits and damages done to property holders, paying compensation to some and assessing others. The privileges both as to eminent domain and taxation which have been granted by legislature to large cities have been dangerously great, and nowhere more so than in the city of New York. In such cities the interests involved are so immense and the danger of corruption so great, that there is a growing desire to restrain the power of the legislature by constitutional provisions. Officers and agents of the municipal corporation may be proceeded against under writs of *mandamus* if they neglect their duties, or *quo warranto* if they exceed or usurp powers. As to torts, the corporation is not liable when it uses its discretionary powers in good faith, or if it fail to secure perfect execution of its by-laws, or for damage by riotous mobs. But where there has been absolute malfeasance or neglect to perform duties, a suit lies, even though liability is not specified in the charter. Municipal corporations are not insurers against accident, but are liable for neglect, as in defective and unsafe streets, yet it has been held that in New England towns there exists no such liability, unless there be special enactment. Where a private individual was injured by the negligence of a contractor employed by the corporation, the latter was held liable. But it is supposed that either notice of the defect or danger must be given to the city, or else the circumstances must be such as to imply knowledge of the facts by the party concerned.

MU'NIMENT-HOUSE, a strong fire-proof apartment or building suited to contain archives, papers, and other valuables.

MUN'JEET (*Rubia cordifolia* or *munjista*), a species of madder (q.v.), of which the root yields an excellent red dye. The plant differs from the common madder in its more distinctly quadrangular stem, its cordate-oblong leaves commonly in fours, and its red berries. It is a native of India, China, Japan, Central Asia, and Siberia. The root has long been used in India as affording a red dye; and is now an article of export to Europe, as a substitute for madder.

MUNK, Salomon, b. 1805, in Glogau, in Silesia, of Jewish parents; studied at Bonn and Heidelberg, and at Paris under Sacy and Chizy; went to Oxford in 1835, in search of the Arabic original of maimonides; and in 1840 was made custodian of the oriental manuscripts in the Bibliothéque de Paris. He accompanied Montefiore and Crémieux to Egypt, bringing back many valuable manuscripts. He gave up his position in the library in 1850 on account of weakness in the eyes. He wrote Arabic and Hebrew critical books from 1833 to 1852, publishing his *Philosophy and Philosophical Works of the Jews*, in German, in 1852.

MUNKACS', a market t. of Hungary, situated on an affluent of the Theiss, 178 m. n.e. of Pesth. The inhabitants are mostly artizans, and the chief production is hosiery. There are also alum manufacturies, saltpeter-works, and in the vicinity, iron-works and mines of rock-crystal, called Hungarian diamonds. A short distance e. from the town is the fortress (founded in 1359) of Monkacs, built upon an isolated height, which, although small and insignificant-looking, yet, from its strong walls and advantageous position, has for the last few centuries, withstood many a seige. Since the beginning of the present century, it has been used as a state-prison. Pop. '69, 8,602.

MUNKACSY, Mihaly, b. at Munkacs, Hungary, studied art with Knaus, and was a medalist of the Paris salon of 1870 and 1874. Among his works are the "Story of the Hunt;" the "Mont de Piété;" the "Night Prowlers;" and that by which he is known in the United States, "Milton dictating to his daughters;" which is in the Lenox library, New York.

MUNRO, Alexander, 1827–71, b. England; a sculptor, whose statues of "Hippocrates," "Davy," and "Galileo," are in the Oxford museum. His principal works were the statue of James Watt, at Birmingham, and of queen Mary in Westminster hall. His portraits in bass-relief were fine. All his productions show masterly grace and elegance. He died in France.

MUNROE, Sir Thomas, 1760–1827, b. in Glasgow; emigrated to India when about 20 years old, and became an officer of the army employed by the East India company. By valuable service in many campaigns, he rose to the rank of maj.gen., and in 1819 was appointed governor of the city of Madras, and soon after knighted.

MUNSEES, Minsis, or Monseys, a tribe of North American Indians, who resided on the upper Delaware and Minisink rivers. In 1663 they joined the Esopus tribe in an attack upon a Dutch fort for which act they were punished by gen. Krieger. They laid claim to the territory extending from the Minisink to the Hudson, the head waters of the Delaware and the Susquehanna, and s. to the Lehigh and Conewago. Early in the 18th c., settlers began to encroach upon their lands and drove them back to the Susquehanna. In spite of the efforts of the Moravians to win them, they moved w. through the Iroquois and joined the French at Niagara. Sir William Johnson, with some difficulty, managed to gain them over to the side of the English. After the fall of the French, some of them joined the Moravians, but during the revolutionary war, most of the tribe under capt. Pipes withdrew to Sandusky and fought for the British. Even after the war they remained hostile, and were not reduced to terms until 1805. In 1808 a portion of the tribe settled on Miami land at White river. Later they joined the Stockbridge Indians near Green bay. In 1839 they were removed to Kansas. The tribe is now nearly extinct. Their language was a dialect of the Algonquin and similar to that of the Delawares.

MUNSELL, Joel, b. Mass., 1808; removed to Albany, N. Y. in 1827, and distinguished himself as a printer, journalist, and author. In 1828 he was the editor of the *Albany Minerva*, and *New York State Mechanic*. He published *Annals of Albany*, 10 vols.

Collections on the History of Albany, 4 vols.; *Every-Day Book of History and Chronology; Chronology of Paper and Paper-making.* His collection of works on printing is the largest ever made in America, and part of it has been purchased for the New York state library.

MUNSON, Æneas, 1734–1826, b. Conn.; educated at Yale, and studied theology. He was chaplain in a colonial regiment during the French war, after which he studied medicine, and began to practice in 1756. He settled at New Haven in 1760, and attained a high rank in his profession there. He was president of the state medical society, and a professor in the Yale medical school from its foundation.

MUNSTER, the largest of the four provinces of Ireland, occupies the s.w., and is bounded on the n. by Connaught, on the e. by Leinster, and on the w. and s. by the Atlantic. It contains the six counties of Clare, Cork, Kerry, Limerick, Tipperary, and Waterford, and the country is described under these heads. Area, 6,064,579 statute acres. The population of the province, which in 1841 was higher than that of any of the other provinces, was shown to be, in 1871, 1,393,485, or 439,743 less than that of Ulster, now the most populous of the provinces.

MÜNSTER, chief t. of the district of the same name, as well as capital of all Westphalia, is situated in 51° 55′ n. lat., and 7° 40′ e. long., at the confluence of the Aa with the Münster canal, 65 m. n.e. of Düsseldorf. The pop. in 1871 was 24,815; in 1875, 35,535. Münster, which is a bishopric, and the seat of a military council, a high court of appeal, and other governmental tribunals, is one of the handsomest towns of Westphalia, retaining numerous remains of medieval architecture, whose quaint picturesqueness is enhanced by the numerous trees and shady allées, by which the squares and streets are ornamented. Among its 14 churches, of which the majority are Catholic, the most noteworthy are the cathedral, built between the 13th and 15th centuries, and despoiled of all its internal decorations by the Anabaptists; Our Lady's church, with its noble tower; the splendid Gothic church of St. Lambert, in the market-place, finished in the 13th c., on the tower of which may still be seen the three iron cages in which the bodies of the Anabaptist leaders, John of Leyden, Knipperdolling, and Krechting, were suspended, after they had suffered the most horrible martyrdom; and the church dedicated to St. Ludgerus, the first bishop of Münster, with its singular round tower, surmounted by an octagonal lantern. The Gothic town-hall possesses historical interest in being the spot at which, in 1648, the peace of Westphalia was signed in a large hall, which has lately been restored, and which contains portraits of all the ambassadors who were parties to the treaty. The palace, built in 1767, is surrounded by fine pleasure-grounds, including horticultural and botanical gardens, connected with the academy; and these, with the ramparts, which, since the Seven Years' war, have been converted into public walks, form a great attraction to the city. Münster is well provided with institutions of charity and benevolence. The old Catholic university of Münster was dismembered in 1818, and its funds apportioned to other educational establishments; and the present academy, which comprises a Catholic theological and a philosophical faculty, is now the principal school. It has a library of 50,000 volumes, a natural history museum, and various collections of art and antiquity connected with it. Münster has one gymnasium, a normal school for female teachers, and a number of town schools. The industrial products of Münster include leather, woolen fabrics, thread, starch, and sugar, besides which there are good carriage manufactories, breweries, and distilleries. The trade is limited to the produce of the country, the principal of which are the noted Westphalian ham and sausages.

Münster was known under the name of Mimigardevorde in the time of Charlemagne, who, in 791, appointed it as the see of the new bishop of the Saxons, at St. Ludgerus. Towards the middle of the 11th c., a monastery was founded on the spot, which in course of time derived its present name from its vicinity to the minster, or monastery. In the 12th c., the bishopric was elevated into a principality of the empire. In the 13th c., the city was incorporated in the Hanseatic league; and in 1532 it declared its adhesion to the reformed faith, notwithstanding the violent opposition of the chapter. During the years 1535 and 1536, Münster was the scene of the violent politico-religious movement of the Anabaptists, when the excesses of these pretended reformers worked a violent reaction in the minds of the people, which had the effect of restoring the prestige of the episcopal power; and although the citizens occasionally made good their attempted acts of opposition to their spiritual rulers, they were finally reduced to submission under bishop Christopher Bernhard of St. Gall, who having, in 1662, built a strong citadel within the city, transferred the episcopal place of residence thither from Koesfeld, where it had been established by earlier bishops. In the Seven Years' war, Münster was repeatedly besieged and taken by both the belligerent parties. The bishopric of Münster, which since 1719 had been merged in the archbishopric of Cologne, although it retained a special form of government, was secularized in 1803, and divided among various royal houses; but subsequently shared in the common fate of other German provinces, and was for a time incorporated with France. The congress of Vienna gave the greater part of the principality to Prussia, a small portion being apportioned to the house of Oldenburg, while Hanover acquired possession of the Münster territories of the mediatized dukes of Aremberg.

MUNTANER', RAMON', 1265–1340, b. Spain. His native town having been burnt by the French in 1285, he became a wandering soldier and minstrel, and for 30 years led an adventurous and eventful life. Returning to Catalonia, he began in 1325 to write the history of the princes of Aragon from the time of James the conqueror until the coronation of Alfonso IV. This chronicle of great events, of which he was the eye-witness, is valuable as a history of his time and is remarkable for its accuracy, naivete, epic beauty and grace. It remained in manuscript until the middle of the 16th century. The two most ancient editions of the original are at Valencia and Barcelona. The former is entitled *Chronica o Descripcio dels fets e hazanayes del inclyt Rey Don Jaume.* It has been translated into German and French, and Lanz at Stuttgart published an edition of the original in 1844.

MÜNTER, FRIEDRICH, 1761–1830, b. Germany; educated at Copenhagen and Göttingen, where he studied theology and archæology. He afterwards continued his archæological researches in Italy, under the patronage of the Danish government. In 1790 he became professor of theology in the university of Copenhagen, and in 1808 bishop of Zealand. He edited the Coptic translation of Daniel, and the statutes of the Templars, and wrote works on the history of Christianity in Denmark, on the inscriptions at Persepolis, and on the religion of the Carthaginians.

MUNTJAK, *Cervus muntjac, Cérvulus vaginalis,* or *Stylocerus muntjac,* a species of deer, abundant in Java, Sumatra, and other islands of the same region. It is about one-fifth larger than the roebuck, which it considerably resembles in form. The horns are remarkable, as there springs from the common base of each an additional horn, which is about 1½ in. in length; the principal horn, which is simple, curved, and pointed, being about 5 in. in length. The female has no horns. The male has large canine teeth or tusks, which also are wanting in the female. Allied species are found in India and China.

MÜNZER, THOMAS, one of the leaders of the Anabaptists (q.v.), was b. at Stolberg, in the Harz, took his degree at Wittenberg as master of arts, and for some time preached the doctrines of the reformation in Zwickau and other places. Ere long, however, he adopted mystic views, and declaimed against what he called the "servile, literal, and half" measures of the reformers, requiring a radical reformation both in church and state according to his "inward light." He proclaimed an entire community of goods, and incited the populace to plunder the houses of the wealthy. Mühlhausen fell for a time under his sway and that of another fanatic named Pfeifer, who joined him. He took an active part in the peasant war, and inflamed the spirits of the insurgents by the wildest speeches and songs; but they were utterly defeated on May 15, 1525, after a severe conflict at Frankenhausen, by the elector John and duke George of Saxony, the landgrave of Hesse, and the duke of Brunswick. Münzer fled, but was taken and carried to Mühlhausen, where he was beheaded along with Pfeifer and a number of others. He showed no dignity or courage in the closing scenes of his life. See Strobel's *Leben, Schriften, und Lehren Thom. Münzer's* (Nürnb. 1795); Seidemann's *Thom. Münzer* (Dresd. and Leips. 1842); and Heinrich Leo in the *Evangelische Kirchenzeitung* (Berl. 1856).

MUN'ZINGER, WERNER, b. Switzerland, 1832; educated at Bern, Munich, and Paris. In 1852 he entered into business in Egypt, but soon after went on an exploring expedition southward in Africa, and was absent for about 6 years. He was attached to the expedition of Heuglin in 1861, but quitted it when it reached n. Abyssinia, and in company with Kinzelbach explored an unknown territory, and determined the course of the river Gash. In 1862 he was placed at the head of the German exploring expedition, succeeding Heuglin, and he endeavored to penetrate to Waday, but was unable to go farther than Kordofan. In 1864 he was appointed British consul at Massowah, and in the Anglo-Abyssinian war he acted as a guide to the English forces, after whose withdrawal he remained at Massowah as consul in the French service. In 1869, while on another exploring expedition to n. Abyssinia, he was attacked by an assassin and dangerously wounded. In 1870 he made a journey to s.e. Arabia, and was appointed governor of Massowah; and the next year he went on a new expedition into the country n. of the Bogos. Besides many contributions to geographical periodicals and the proceedings of geographical societies, he has published: *Customs and Laws of the Bogos,* 1869; *East African Studies,* 1864; *The German Expedition into East Africa,* 1865; and a *Dictionary of the Tigre Language.*

MUOT'TA VALLEY, a lofty and secluded valley in the canton of Schwytz, Switzerland, through which the Muotta river flows down to lake Lucerne. Its chief place is the village of Muotta, 4 m. e.s.e. of Schwytz. Pop. 1,759.

MURAD V. (MEHEMET MURAD EFFENDI), Sultan of Turkey, b. Turkey, 1840; son of Abdul-Medjid, late sultan of Turkey. On May 30, 1876, the sultan Abdul-Aziz was deposed from his throne; and on the same day Murad was visited by a high dignitary of the state and informed that he was to become sultan, whereupon he proceeded to the great hall of the Seraskierat and was duly installed. Soon after his accession he discovered his total incapacity to conduct the government in the face of the difficulties by which it was surrounded. He became subject to fits of melancholia and lethargy, from which it was nearly impossible to rouse him. An eminent physician was sent for to Vienna, who, after an examination, pronounced his patient unfitted by the nature of his malady for the conduct of the difficult and delicate duties of his position. Upon the advice of the physician in question, the ministerial council, after referring the law questions of the case to the sheikh ul-Islam, decided upon his deposition, which was accordingly effected on Aug. 31, 1876. He was succeeded by a younger brother, Abdul-Hamid, who continues at this date (1881) to occupy the Turkish throne.

MURÆ'NA, a genus of malacopterous fishes, of those to which the name eel is commonly given, the whole of the eels being sometimes included in the family *murænidæ*. See Eel. The true *murænæ* have no fins except the dorsal and anal, which are low and fleshy. They have one row of sharp teeth in each jaw. The head is very large, and the jaws are moved with great power. The muræna of the Romans, or Murry (*M. helena*), abounds in the Mediterranean, and is sometimes of large size, four feet or more in length, golden yellow in front and purple towards the tail, beautifully banded and mottled. It is much thicker in proportion to its length than any of the fresh-water eels. Its flesh is white and highly esteemed. It prefers salt water, but can accommodate itself to a fresh-water pond. The ancient Romans kept and fed it in vivaria. The story of Vedius Pollio feeding his murænas with offending slaves is well known, This muræna has been caught on the British shores, but very rarely.

Allied to the genus muræna is the genus *sidera,* found in the Pacific.

MURÆ'NIDÆ. See Eel, *ante.*

MURAL CIRCLE, an astronomical instrument for taking declinations; consisting of a large circle built against the wall (whence its name), movable on its axis in the plane of the meridian, and with a telescope attached, also in the plane of the meridian, which turns about an axis. The circle is graduated, the whole instrument counterweighted and furnished with an illuminating apparatus for night readings. Readings are made accurate by set-screws and microscopic micrometers. The plane of the limb and the optical axis of the telescope are made parallel to the meridian by leveling and sweeping screws, and the cross lines of the eye-piece should follow a star near the equator their whole length. The instrument being rectified, the height of a star above the horizon is measured by a cup of mercury; the star is observed directly and then by reflexion, the half sum of the readings being the correct angle. The co-latitude of the place is obtained as with the theodolite. As the tube is movable about the circle, reading should always be checked by reiteration; with more than one limb of the circle.

MURAL CROWN, in heraldry, a crown in the form of the top of a circular tower, masoned and embattled. It is meant to represent the crown which was given by the Romans as a mark of distinction to the soldier who first mounted the walls of a besieged town, and fixed there the standard of the army. A mural crown supporting the crest, in place of a wreath, occurs in the achievements of several of the English nobility, and in various grants of arms made in the early part of the present century to officers who had distinguished themselves in the war. Viscount Beresford, in consequence of his gallantry at the battle of Albuera, obtained as crest, issuing out of a mural crown, a dragon's head with its neck pierced through by a broken spear, the head of the spear, point downwards, being held in the mouth of the dragon.

MURAT, Joachim, king of Naples, was the son of an innkeeper at La Bastide-Fortunière, near Cahors, in France, and was born there March 25, 1767 or 1768. He was at first intended for the priesthood, and actually commenced the study of theology and canon law at Toulouse, but entered the army, and being threatened with punishment for insubordination, deserted, and after spending some time at home, proceeded to Paris, where, it is said, he was for some time a waiter at a café, but soon obtained admission into the constitutional guard of Louis XVI. On the outbreak of the revolution, he was made a sub-lieut. in a cavalry regiment. His gallantry and his extreme republicanism soon won him the rank of colonel. He attached himself closely to Bonaparte, under whom he served in Italy and in Egypt, signalizing himself in many battles; rose to the rank of gen. of division (1799); returned with Bonaparte to France; and rendered him most important assistance on the 18th Brumaire, by dispersing the council of five hundred at St. Cloud. Bonaparte now intrusted him with the command of the consular guard, and gave him his youngest sister, Caroline, in marriage. Murat commanded the cavalry at Marengo, where he greatly distinguished himself. On the establishment of the French empire, he was loaded with honors. He continued to command the cavalry in the armies led by the emperor, and contributed not a little to the victory at Austerlitz, and to many other victories. In 1806 the newly-elected grand duchy of Berg (q.v.) was bestowed upon him. On Aug. 1, 1808, he was proclaimed king of the Two Sicilies by the style of Joachim I. Napoleon. He took possession of Naples, but the Bourbons, through the support of Britain, retained Sicily.

Murat possessed the qualities requisite for a gen. of cavalry rather than those of a king. He was very deficient in political skill and energy; but by the moderation of his government, he won the hearts of his subjects. Even his love of pomp and show, and the theatrical splendor of his equipment, which were a subject of mirth in France and Germany, rather gratified the Neapolitans. He endured with difficulty the yoke of Napoleon, which left him little but the outward show of royalty. In the expedition against Russia, he commanded the whole cavalry, but on its failure, he returned to Naples, anxious and discontented. He joined the French army again in 1818, but after the battle of Leipzig, withdrew to his own dominions, determined on breaking the French fetters with which he was bound. He concluded a treaty with Austria, and a truce with the British admiral, and promised the allies an auxiliary corps. He hesitated, however, even after his new course seemed to have been decisively adopted; and finding his position insecure after Napoleon's overthrow, he entered into private communications with him at Elba. On the emperor's return to France, Murat placed himself at the head of an army of 40,000 men, and commenced a hasty war against Austria. He was defeated at Ferrara, April 12, 1815, and again at Tolentino, May 2. With a few horsemen he fled to Naples, where all was insurrection and commotion; thence to the island of Ischia, and found his way to France, whilst his wife and children took refuge in the British fleet. After Napoleon's final overthrow, he found refuge in Corsica, from which he proceeded in a foolhardy manner with a few followers to the coast of Naples, and proclaimed himself king and liberator, but was presently taken prisoner, and after trial by a court-martial, was shot in a hall of the castle of Pizzo, Oct. 13, 1815. See Léonard Gallais, *Histoire de Joachim Murat* (Paris, 1828), and Coletta, *Histoire des Six derniers mois de la Vie de Joachim Murat* (Paris, 1821). His widow assumed the title of countess of Lipona, and resided in the neighborhood of Trieste, where she died in 1839. His two sons went to the United States, where the elder, NAPOLEON ACHILLE MURAT, settled in Florida, and published a number of works on the constitution and politics of his adopted country. He died April 15, 1847. The younger, NAPOLEON LUCIEN CHARLES, married an American lady in 1827, but suffered several reverses in fortune, and madame Murat was obliged to open a boarding-school for the support of herself and her husband. Twice he attempted to return to France secretly (in 1837 and 1844), but failed on both occasions. The revolution of 1848, however, opened the country to him. He attached himself closely to prince Louis Napoleon; and was in 1849 French ambassador extraordinary at Turin. In 1852 he was made a senator; and in 1853 he received the title of prince. The Italian revolution appeared to present some chances for him, but nothing came of these. He was made prisoner by the Germans at Metz in 1870.

MURATORI, LUDOVICO ANTONIO, a celebrated antiquary and historian, was born at Vignola, in the duchy of Modena, Oct. 21, 1672. From a very early period, his predilection for historical and literary pursuits began to manifest itself; and, having entered into holy orders, without, however, accepting any ecclesiastical office, his life was devoted partly to the literature of his profession, but mainly to researches in history, both sacred and profane, especially the history of his native country. In his 22d year, he was appointed one of the librarians of the Ambrosian library at Milan, a post which has since received equal celebrity from a successor not unworthy of the fame of Murat, the illustrious Angelo Mai (q.v.). Here he gave to the world his first publication, a collection of inedited Greek and Latin fragments, under the titles of *Anecdota Græca* and *Anecdota Latina*. But his most import labors were reserved for the capital of his native duchy, whither, in 1700, he was recalled by the duke of Modena, to take charge of the celebrated D'Este library, and of the ducal archives; his only ecclesiastical preferment being that of provost of the church of St. Mary, at Pomposa. From the date of his return to Modena, Muratori began to devote himself more exclusively to Italian history, especially to the history of medieval Italy; and his labors in this department extended over the greater part of his life. It was not until the year 1723 that the first volume of his great collection, *Rerum Italicarum Scriptores*, appeared, and the work proceeded at regular intervals for nearly 30 years, the last of the 28 folio volumes which compose it bearing the date of 1751. This immense publication, which was produced by the joint contributions of the princes and higher nobility of Italy, embraces a range from the 5th to the 16th c., and contains all the chronicles of Italy during that vast period, illustrated with commentaries and critical notices. It was accompanied by a collection of dissertations illustrative of the religious, literary, social, political, military, and commercial relations of the several states of Italy during the period, in 6 vols. folio, 1738–1742, a work which, although far from being exempt from errors, is still regarded as a treasure-house of medieval antiquities. While engaged in these prodigious labors, Muratori carried on an active literary correspondence with the scholars of the various countries of Europe, and contributed essays not unfrequently to the principal historical and literary academies, of most of which he was a member. He was the first, moreover, to undertake a general history of Italy from the commencement of the vulgar era down to his own time. It is in 12 vols. 4to, and still retains its value as a book of reference, having been continued by Coppi down to the year 1819. In his capacity of archivist of the duke of Modena, he compiled, in 2 vols. folio, the *Antiquities of the d'Este Family* (1710–40), as well as a series of historical and polemical treatises on certain territorial questions in dispute between the house of Modena and the court of Rome. To the department of classical scholarship, Muratori's collection of *Inscriptions* (6 vols. folio, 1739–43), which, in this point of view, was a necessary supplement to the collection of Gruter and the other antiquaries who had preceded him, is still acknowledged as a most important contribution; and he has also left works of standard merit in the departments of jurisprudence, of literary criticism, of poetry, of biography, and even of the history of medical science. In the studies of his own profession, as well liturgical and historical, as dogmatical and even ascetical, Muratori, although he did not follow the method of the schools, was hardly less distinguished than if he had made these the pursuit of his life. Some of his opinions were regarded with disfavor, if not directly condemned; but his vindication of himself, addressed to the learned pope Benedict XIV., drew forth a warm and honorable testimony to the uprightness of his motives, which, without approving of the opinions to which exception had been taken, declared them free from the imputation of being contrary either to the doctrine or to the discipline of the church. Although Muratori's life was essentially that of a scholar, yet his exactness in discharging the duties of a parish priest was beyond all praise, and several of the existing charitable institutions of Pomposa were founded by him. He died at Modena, Jan. 28, 1750, in his 78th year. His works, which it would be tedious to enumerate in full detail, fill 46 vols. in folio, 34 in 4to, 13 in 8vo, and many more in 12mo. Some of these are posthumous, and were published by his nephew, G. F. Muratori, from whom we also have a life of his distinguished uncle, in 4to, printed at Omer, 1758.

MURATORIAN FRAGMENT, or CANON OF MURATORI, a very important treatise of Biblical MSS. It probably belongs to the latter half of the 2d century. It is valuable as affording evidence concerning the writings which were regarded as canonical by the churches of that day. It contains as such the gospel of Luke—which it calls the third, the existence of the first two being implied—the gospel of John, the Acts of the Apostles, 13 epistles of Paul, 1 of Jude, 2 of John, the revelations of John and Peter; the latter, however, as being not universally acknowledged. The epistles of James and of Peter, and the epistle to the Hebrews, are omitted. It was brought into notice by Muratori, a distinguished archæologist, at the close of the 17th century.

MURAVIEF, an ancient boiar family, originally of Moscow, which in 1488 was presented by Ivan Vasiliévitch I. with large estates in the province of Novgorod. Many members of this family took an important part in the military, literary, and political history of their country during the 18th and 19th centuries. The following are the most distinguished:—(1.) *Nikolaï Ieroféiévitch* was capt. in the engineer corps, and in 1752 published the first work on algebra in the Russian language. Under Catherine II. he had charge of the Russian topographical works, became lieut.gen. and governor of Livonia, and died at Montpellier in 1770.—(2.) *Mikhail Nikititch* (1757–1807). At the age of 28, Catherine II. took him from the imperial guard to tutor her grandchildren, the grand dukes Alexander and Konstantin, for whom he composed works in prose and poetry distinguished for pure style and noble sentiments. In 1796 he became curator of the university of Moscow, in 1802 senator, and in 1804 councilor of state. His works were published in 1820 in three volumes.—(3.) *Nikolaï Nasarovitch*, privy councilor, secretary of state, and until 1832 director of the imperial private chancelry, was also known as a writer. His works are published in St. Petersburg in five volumes.—(4.) *Nikolaï Nikolaïévitch* (1768–1840). He studied at the university of Strasburg, and on his return to Russia became a lieut. in the marine service. In the battle of Rotschensalm he was wounded and taken prisoner. Set at liberty by the peace of Verelä, he left the marine for the army, was appointed lieut.col., and founded near Moscow a private school for the officers of the general staff. He served in the campaigns of 1812–14 as col. and chief of staff under count Tolstoï, arranged with gen. Dumas for the capitulation of Dresden, and shortly after took part in the siege of Hamburg. He then returned with the rank of maj.gen. to his school, which in 1816 was declared to be imperial, and which he directed until 1823. During the last years of his life he became interested in agricultural pursuits and rural economy. He was one of the founders and most active members of the economic society of Moscow, and published a translation of Thaer's *Principles of Rational Agriculture*. He left five sons, all of whom became distinguished.—(5.) *Alexander Nikolaiévitch* (1792–1864), the eldest son of the preceding. In 1825 he took part in the conspiracy which broke out at the accession of Nicholas I. In consideration of his father's services his life was spared, and he was merely exiled to Siberia. Though he was afterwards permitted to return, his services were not required until the Crimean war, when he became maj.gen. and in 1856 governor of Novgorod. He was interested in the emancipation of the serfs. At the time of his death he was lieut.gen. and member of the senate of Moscow.—(6.) *Nikolaï Nikolaïévitch* (1793–1866). He entered the army in 1810, took part in all the campaigns of 1812–15, and won distinction for bravery at Borodino, Lutzen, Bautzen, Kulm, Leipsic, and under the walls of Paris. In 1817 he was attached to gen. Iermolof's staff, and served in the Caucasus. In 1822 he published his *Travels in Turkomania and Khiva*, which was translated into German, English, and French. In 1827 he became chief of staff under gen. Paskiévitch, took part in all the principal battles of the war with Persia, was promoted to the rank of maj.gen., and won great distinction at Kars and Akhalzik in the war of 1828. In 1830 the Polish rebellion broke out, and Muravief was recalled from an expedition against the Lesghians to take command of the Lithuanian grenadier brigade, with which he defeated the old Polish gen. Siéravski, near Kazimierz. Promoted to the rank of lieut.gen., he commanded the right wing at the storming of Warsaw in 1831, and captured the fortifications of Rakoviec. At the end of the next year he was sent to Egypt with special instructions to incite Mehemet Ali to revolt against the Turkish government. He then took charge of the Russian forces which landed on the shores of the Bosporus. In 1838 he fell into disgrace, and lived secluded for ten years, at the end of which he was called again into active service, and in 1854 was made commander of the expeditionary forces in the Caucasus. After a siege which lasted from the first of June till the last of November, he captured the important fortress of Kars. This victory, which partially redeemed the loss of Sevastopol, brought Muravief the title of prince and the appellation Karski. He was then made a state councilor, and put at the head of the commission to investigate the abuses committed during the Crimean war. In 1861 he was made chief of the regiment of grenadiers of Samogitia, one of the greatest honors which the czar can accord to generals not belonging to the imperial family.—(7.) *Mikhaïl Nikolaïevitch* (1796–1866). At the age of 15 he was acting professor in the military school founded by his father. In 1813 he fought against the French, and at the conclusion of the campaign returned to his favorite study of mathematics, and translated into Russian Garnier's *Geométrie Analytique*. In 1823 he entered the army, and soon became col. In 1831 he advanced from maj.gen. to the military governorship of Grodno, and showed great activity in repressing the troubles which broke out in his province after the Polish revolution. He afterwards became military governor of Kursk, and entered the civil administration as privy councilor and senator. He was elected president of the Russian geographical society, and caused a great scientific expedition to be sent to Siberia. In 1857 he became minister of the crown lands and president of the council for the administration of the appanages of the state. He devoted his energies to the fostering of agriculture, founded an agronomic academy near Petroosk, but was violently opposed to the liberation of the serfs. In the student riots of 1861 he used such cruel modes of repression as to win universal hatred, and was removed from his functions. The Polish insurrection, however, brought him to the fore, and in 1863 he was named governor-general of Vilna with special honors. He acted with such energy that in a few months the insurrection was entirely put down. The czar, in recognition of his services, made him a count and placed him at the head of the commission to seek out and punish the accomplices of Karakasof, who attempted the assassination of Alexander II., in 1866.—(8.) *Nikolaï Nikolaïevitch*, b. 1810; entered into the army, served in the Caucasus, and by his bravery won the rank of maj.gen. and commander of the coasts of the Black sea. In 1847 he was named governor-general of eastern Siberia and made lieut.gen. He gained for Russia the entire territory of the Amur, and concluded the treaty of Aigun, May 28, 1858, by which this country was definitely ceded by China. His services were rewarded by the title of count and the name Amurski. In the summer of 1859 he went with twelve ships to Yedo, and concluded a favorable treaty with Japan. He then returned to St. Petersburg by way of Siberia. He resigned his governorship in 1861, and was named member of the imperial council.—(9.) *Andréi Nikolaïévitch* entered, at an early age, the civil administration; became councilor and kammerjunker, and about 1830 undertook a journey to Syria and Palestine, which he described in his *Pilgrimage to the Holy Places*. He subsequently traveled in his own country, in Italy, and in the east, and published the results of his observations in several volumes. He wrote also besides many theological and dramatic works, a *History of the Bible*, *History of the First Four Centuries of Christianity*, *History of Jerusalem*, *History of the Russian Church*, *Description of Georgia and Armenia*, etc. He was a member of the holy synod.—A branch of the Muravief family, about 1730, married a daughter of Apostol, the hetman of the Cossacks, whose name was added to his own.—(1.) *Ivan Matiriévitch* Muravief-Apostol (1769–1851). Under the emperor Paul, Ivan was sent to the courts of Saxony and Madrid, and on his return became privy councilor and senator. He had a thorough knowledge of the ancient and modern languages, and translated into Russian Sheridan's *School for Scandal*, the *Satires* of Horace, and the *Clouds* of Aristophanes. In 1820 he traveled in the Taurid, and published the results of his archæological investigations. His old age was saddened by the political ruin of his three sons, whom he survived for more than a quarter of a century.—(2.) *Sergii Ivanovitch* was lieut.col. of the regiment of Tchernigof, a man of remarkable energy and learning, and the leading spirit in the Dekabrist conspiracy of 1825. Despite the news of the failure of the rising in St. Petersburg, he proclaimed the grand duke Konstantin emperor, and seized the town of Vasilkof. Troops were sent against him, and, after a gallant resistance, in which he was wounded and his brother Ippolit was killed at his side, he was captured, taken to St. Petersburg, and hung in July, 1826. His other brother Matvéi was also a Dekabrist, and was sent to Siberia for twenty years.

MURCHISON, CHARLES, 1830–79; b. Jamaica, of Scotch descent. He studied at the university of Aberdeen from 1845 to 1851, obtaining a prize for Greek scholarship, the Balfour medal for skill in plant dissection, and the Thompson prize. After graduating at the medical school in 1851 with high honors, he went to Turin, as physician to the British embassy. On his return in 1852 he resided a short time in Edinburgh, studied in Dublin and Paris, and then accepted the position of professor of chemistry in the Calcutta medical college. He remained in India until 1855 and published a treatise on the diseases of that country. He then returned to England, and in London was connected as lecturer, demonstrator of anatomy, assistant physician, or managing physician with the Westminster general dispensary, St. Mary's, King's College, Middlesex, and the

London Fever hospitals. Besides many medical and scientific contributions to the *Lancet* and other journals, he published several treatises, the most important of which were *Diseases of the Liver* and *Continued Fevers of Great Britain*. In 1871 he was appointed professor of the principles and practice of medicine, and though his practice was very large and his published works of great scientific value, yet probably his highest claim to fame arises from his precision, power, and thoroughness as an instructor. In 1877 he was made president of the pathological society. His death was caused by heart disease, resulting from a fever contracted in his professional duties. Though for several years aware that continued rest alone could avert a sudden death, he in no way relaxed his labors, and died in his consultation room.

MURCHISON, Sir RODERICK IMPEY, geologist and geographer, was born at Tarradale, Ross-shire, in 1792. He was educated at the grammar-school, Durham, and having a bias for military life, next studied at the military college, Marlow. He entered the army at an early age, and served as an officer in the 36th regiment in Spain and Portugal. He was placed on the staff of his uncle, gen. sir Alexander Mackenzie, and then obtained a captaincy in the 6th dragoons. Quitting the army in 1816, he devoted himself to science—more especially to geology. He afterwards traveled in various parts of the globe. He found the same sedimentary strata lying in the earth's crust beneath the old red sandstone in the mountainous regions of Norway and Sweden, in the vast and distant provinces of the Russian empire; and also in America. The result of his investigations was the discovery and establishment of the Silurian system, which won for him the Copley medal of the royal society, and European reputation as a geologist. His subsequent exposition of the Devonian, permian, and Laurentian systems increased and confirmed his reputation. He explored several parts of Germany, Poland, and the Carpathians; and in 1840 he commenced a geological survey of the Russian empire, under the countenance of the imperial government. M. de Verneuil was associated with him in this great work, completed in 1845. Struck with the resemblance in geological structure between the Ural mountains and the Australian chain, Murchison, in his anniversary address in 1844, first predicted the discovery of gold in Australia. In 1846, six years before that metal was practically worked, he addressed a letter to the president of the royal geological society of Cornwall, inciting the unemployed Cornish tin-miners to emigrate and dig for gold in Australia. He was elected president of the British association for the advancement of science in 1846; president of the royal geographical society in 1844 and 1845; was re-elected in 1857, and continued to hold that post till 1870, when he was compelled to resign it by paralysis. His anniversary addresses to the geographers were of great interest and value. Perhaps no man of the present century has done more to promote geographical science at home, and kindle the spirit of adventure among those engaged in Arctic explorations on the one hand, and African discovery on the other. In 1855 he succeeded sir H. de la Beche in the office of director of the museum of practical geology. He was a D.C.L of Oxford, LL.D. of Cambridge, and a vice-president of the royal society. He was knighted in in 1846, made K.C.B. in 1853, and a baronet in 1863. From the emperor of Russia he received the grand cross of St. Anne, and also that of St. Stanislaus. He died Oct. 22, 1871. The greater portion of his contributions to science were published in the *Transactions* of the geological and other societies. His principal works were *The Silurian* (1836); *The Geology of Russia in Europe and the Ural Mountains*, in 1845 (2d ed. 1853). He also published volumes on the *Tertiary Deposits of Lower Styria, etc.* (1830), the *Geology of Cheltenham* (1834), etc.—See *Life of Sir Roderick Murchison*, by Archbishop Geikie, LL.D. (1875), and obituary notice by sir Henry Rawlinson in *Proceedings of the Royal Geographical Society*, vol. xvi. No. 4.

MURCHISO'NIA, a genus of fossil gasteropodous mollusca belonging to the family *Haliotidæ* and so named in honor of sir R. I. Murchison. The genus consists of at least 50 species, all which are characteristic of the paleozoic rocks, occurring in the series from the lower Silurian up to the permian The shell differs from the large genus *pleurotomaria* only in being very much elongated. Like it, the whorls are sculptured and zoned, the aperture is channeled in front, and the outer lip is deeply notched.

MURCIA, a former province of Spain, now subdivided into the smaller provinces of Albacete and Murcia, is situated in the s.e. of the peninsula. It is bounded on the n. by New Castile, on the e. by Valencia, on the s. by the Mediterranean, and on the w. by Granada, Andalusia, and New Castile. Area, 10,311 sq.miles. Pop. '70, 660,040 (of modern province, 439,067). In the n.e. the province is partly level; but in the s.w. it is composed of great valleys, high plateaus, and mountain ranges. The coast comprises stretches of desert. The principal river is the Segura, which flows through the middle of the province from w. to e. On the whole, Murcia is not very productive, and never will be, on account of the failure of water, partly caused by the destruction of the forests. The only fertile districts are the valleys of the Segura, and the side-valleys of Lorca, Albacete, Chinchilla, and Almansa. The Esparto wastes have remained uncultivated since the banishment of the Moriscoes in 1610; and the canal of Murcia, which is intended to irrigate the arid Campo de Cartagena, is not yet finished. Murcia is one of the most thinly peopled districts of Spain. The north yields wheat and barley; the south maize, fruits, wine, oil, silk, and hemp. Goats, sheep, and swine are reared in great numbers.

In metals, salt, and mineral springs Murcia is abundant; it has also many smelting-works for iron, lead, and copper ores, brimstone, and alum. The roads, however, are in the most wretched condition, and industry in general is still in a backward state. The province was frightfully devastated by a great earthquake, 18-21 March, 1829. Murcia was conquered by the Arabs in 711; after the fall of the caliphate of Cordova it became an independent Arab kingdom, but six years afterwards was subjugated by king Ferdinand III. of Castile in 1241.

MURCIA (the Roman *Murgi*), a large, important, and ancient town of Spain, capital of the province of the same name, on the left bank of the Segura, and near the junction of that river with the Sangonera, 50 m. s.w. of Alicante. It stands in the midst of a beautiful and luxuriantly productive *huerta* or garden, 16 m. in length, and from 7 to 8 m. wide. This *huerta* forms a portion of what is called the vale of Murcia; is well watered, has a bright green appearance even in winter; produces wheat, flax, pulse, and vegetables, and grows innumerable mulberry, orange, fig, and palm trees. The streets of Murcia are narrow but clean, and the houses are gaudily painted in pink and yellow Its squares are filled with cypress, orange, lemon, and other southern trees. It is the see of a bishop suffragan to Toledo; the cathedral is surmounted by a tower begun in 1522, completed in 1766, and crowned by a dome from which a magnificent view is obtained. The city contains few objects of fine art, a circumstance which is accounted for by the fact that, on the occasion of its siege by Sebastiani, that general, after promising that persons and property should be respected, entered the town April 23, 1810, and rifled it of its wealth and art-treasures. Silks, linens, baskets, mats, and cordage are manufactured, and oil-mills, tanneries, and other works are in operation. Pop. 80,000.

MURDER is the crime of killing a human being of malice aforethought, and is punishable with death. It is immaterial what means are employed to effect the object. Blackstone says that the name of murder, as a crime, was anciently applied only to the secret killing of another, which the word *moërda* signifies in the Teutonic language. And among the ancient Goths in Sweden and Denmark the whole vill or neighborhood was punished for the crime, if the murderer was not discovered. Murder is defined by Coke thus: "When a person of sound memory and discretion unlawfully killeth any reasonable creature in being, and under the king's peace, with malice aforethought, either express or implied." Almost every word in this definition has been the subject of discussion in the numerous cases that have occurred in the law-courts. The murderer must be of sound memory or discretion; i.e., he must be at least 14 years of age, and not a lunatic or idiot. The act must be done unlawfully, i.e., it must not be in self-defense, or from other justifiable cause. The person killed must be a reasonable creature, and hence killing a child in the womb is not murder, but is punishable in another way (see INFANTICIDE). The essential thing in murder is that it be done maliciously and deliberately; and hence, in cases of hot blood and scuffling, the offense is generally manslaughter only. Killing by dueling is thus murder, for it is deliberate. It is not necessary, in order to constitute murder, that the murderer kill the man he intended, provided he had a deliberate design to murder some one. Thus if one shoots at A, and misses him, but kills B, this is murder, because of the previous felonious intent, which the law transfers from one to the other. So if one lays poison for A, and B, against whom the poisoner had no felonious intent, takes it, and is killed, this is murder. Formerly, in England, the benefit of clergy (q.v.) was allowed in cases of murder, till it was abolished by 7 and 8 Geo. IV. c. 28. The only sentence on murderers is now death, which is carried out by hanging. Formerly the murderer was directed after death to be hung on a gibbet in chains near the place of the crime. Formerly, also, dissection was added as part of the sentence, and the execution was to take place on the day next but one after sentence. But now an interval of a fortnight usually takes place, and the body is buried in the precincts of the prison. Attempts to murder were until recently punishable in England like capital felony; but now attempts to murder are punishable only with penal servitude for life, or for not less than three years.

MURDER (*ante*). The common law inferred a wrongful intent from the mere fact of the killing, so that the burden lays upon the defendant of establishing his innocence of malice. Under the definition "with malice aforethought, express or implied," many kinds of homicide which are now considered to involve a much smaller degree of guilt, were classed under the one head of murder. By the common law it was murder to secure by perjury the conviction of an innocent person upon a capital charge; but at the present day such a crime would be considered only as a perjury which should receive an aggravated punishment. At the common law, too, the procuring of a person to commit suicide was murder if the suicide was accomplished. So it is said in the books that if two persons agree to commit suicide, and attempt to carry their design into execution, but only one dies, the survivor is guilty of murder if he were present at the commission of the suicide; otherwise he is an accessory before the fact. Both of the above-mentioned cases would probably now be considered as simple manslaughter. According to Hale in his *Pleas of the Crown*, if a person by threats or otherwise cause the death of another by putting him into "a passion of grief or fear," the former is guilty neither of manslaughter or murder; and such is, probably, still the law, though it has been doubted. If a number of persons conspire to commit an unlawful act, in the execution of which murder is committed, they all are guilty of murder. The only compulsion which can excuse a murder must be an irresistible violence, such as would put a man of discretion and courage into fear for life or limb. There has been considerable controversy as to the burden of proof in cases of murder, and it has sometimes been held that, after the prosecution has shown that the death set out in the indictment was caused by the prisoner, the burden of proof then rests upon him to show justification or want of malice. The evidence relied upon may of course be either direct or circumstantial. In most of the states murder is divided into degrees, and only murder in the first degree is punished capitally. Murder committed deliberately with express malice aforethought, and murder committed, to use the words of the Massachusetts statute, "in perpetrating or attempting to perpetrate, any crime punishable with death, or imprisonment for life." is murder in the first degree; all other murder is in the second degree. The special classes of crime, outside of deliberate premeditated killing, which will constitute murder in the first degree, vary somewhat according to the statutes of each state.

MURDOCK, James, d.d., 1776–1856; b. Conn., of Scotch-Irish descent. At the age of 14 he was left an orphan; graduated at Yale college in 1797; studied theology with Dr. Dwight; was for a short time principal of Hopkins grammar school, New Haven, and for a year of Oneida academy, N. Y.; licensed to preach in 1801; was pastor of the Congregational church in Princeton, Mass., 1802–15; professor of ancient languages in the university of Vermont, 1815–19; professor of sacred rhetoric and church history in the Andover theological seminary 1819–28. In 1829 he removed to New Haven and devoted himself to literary work. His published works are two discourses on the atonement; a translation of Muenscher's *Elements of Dogmatic History;* a translation of *Mosheim's Institutes of Ecclesiastical History*, 3 vols.; *Sketches of Modern Philosophy; a Congregational Catechism;* translation of *Mosheim's Commentaries*, etc.; *The New Testament; a Literal Translation from the Syriac Peshito Version*—the latter a very serviceable work. He was an eminent linguist and philologist, and contributed many articles to theological reviews.

MURDOCK, James Edward, b. Philadelphia, 1811; appeared first as an actor in Philadelphia in 1829. In 1833 he appeared with Miss Fanny Kemble, and from that time was a leading actor in tragedy and comedy. In 1838 he left the stage, and opened a school in Boston for mental and physical culture. Returning to the stage he visited California in 1853. In 1855 he went to Europe, and played at the Haymarket theater with great applause. In 1857 he returned to the United States. He has distinguished himself as an elocutionist, and in conjunction with William Russell published *Orthophony, or Culture of the Voice.* He was on the staff of gen. Rousseau in the war of the rebellion, attending specially to the sick and wounded; also he gave popular readings in many parts of the country for the benefit of the U.S. sanitary commission. Since the war he has resided in Philadelphia.

MURE, William, 1799–1860; b. Scotland; educated at Westminster school and at the university of Edinburgh; subsequently studied several years in Germany, and became a thorough classical scholar. His articles in the *Edinburgh Review* on the literature of modern languages were pronounced brilliant by Moore and Jeffrey. He published *Brief Remarks on the Chronology of the Egyptian Dynasties; A Dissertation upon the Calendar of the Zodiac of Ancient Egypt.* In 1842 he published a *Journal* of travels in Greece and the Ionian islands, and portions of a *Critical History of the Language and Literature of Ancient Greece*, 5 vols. He also edited the *Caldwell Papers*, 3 vols. He represented Renfrewshire in parliament in 1846–55, and was lord rector of Glasgow in 1847–48.

MURET, or MURETUS, Marc Antoine, 1526–85; b. France; became a proficient scholar in Greek and Latin; and when but 18 lectured on Terence and Cicero in the college of Auch. In 1554 he went to Venice, where he became a friend of Paolo Manuzio, who published some of his books. In 1559, at the invitation of the cardinal Ippolito d'Este, he took up his residence in Ferrara; with him he came to Rome, where he enjoyed the favor of Pius V. and Gregory XIII. He entered the priesthood, was presented to a number of livings, and at the time of his death was professor of civil law. His principal works are *Commentarius de Origine Juris, Commentarius de Legibus*, etc., and *Notæ in Justiniani Institutiones.* In one of his *Orations* he extols Charles IX. of France for having destroyed the Protestant heresy. His Latin poems are fluent and polished, but show little poetical talent. His commentaries on various classical authors are of considerable value.

MU'REX, a Linnæan genus of gasteropodous mollusks, of which has now been formed the family *muricidæ*, belonging to the order *pectinibranchiata* of Cuvier. The sexes are distinct; the animal has a broad foot, often much expanded; the eyes are not on stalks; the shell has a straight canal in front, often prolonged through part of a very long beak; no canal behind. The *muricidæ* all prey on other mollusks, boring through the shells with their hard-toothed proboscis. The name Rock-shell is often given to many species of murex; and some, from the length of the beak, are called Woodcock-shell. Some have the shell beset with long and regularly arranged spines. The whorls of the shell are marked with ridges, or *varices.* Some species of murex are found on the British coasts. Species are found in all parts of the world; the largest are tropical. The ancients obtained their purple dye (see TYRIAN PURPLE) from species of murex, particularly *M. trunculus* and *M. brandaris.* The VENUS COMB of the Indian seas is *M. tribulus,* a very delicate and beautiful shell, with many long thin spines. Fossil *muricidæ* are numerous, but are scarcely found in any formation older than the eocene tertiary.

MUREXIDE, purpurate of ammonia, or Roman purple, a curious coloring matter obtained from guano. It is similar to the purple dye or Tyrian purple of the ancients, which was made from a species of *murex*—hence its name. Murexide is a product of uric acid, and as this exists in abundance, and in a very free state, in guano, that material has been found one of the best sources from which to obtain it. One process used by Mr. Rumney of Manchester, the chief manufacturer of this material, to produce murexide, is to dissolve uric acid in dilute nitric acid, and after evaporating for some time at a temperature a little short of boiling, whilst still hot, to add a slight excess of ammonia. Two compounds are formed by this process, alloxan and alloxantin, and their mutual reaction on each other results in the formation of the beautiful minute green metallic-lustered crystals of murexide, which, in combination with some of the compounds of lead and mercury, yield most brilliant red and purple dyes. The use of murexide was becoming extensive until the discovery of the aniline colors, the greater brilliancy of which has checked its employment. Murexide is used in printing both cotton and silk goods, which, under the name of the "Roman-purple style," has been brought to great perfection by several large firms.

MUR'FREESBORO', a t. in Rutherford co., Tennessee; pop. 3,502; distant 32 m. from Nashville, on the Nashville, Chattanooga and St. Louis railroad. Its situation is attractive and healthy, on an extended tract of level land, the soil fertile, and the climate salubrious. For 10 years, 1817–27, it was the capital of the state. Union university, a Baptist institution founded in 1841, is situated here; there is also an important college for girls.

MURFREESBORO', BATTLE OF, known also as the battle of Stone River, began on Dec. 31, 1862, and ended Jan. 4, 1863, with the flight of the confederates, and the occupation of the town by the union forces. The latter had been reorganized at Nashville by gen. Rosecrans, and left its position on Dec. 26; forming its line of battle, after a march of five days and constant skirmishing, on the w. bank of Stone river, the left under Crittenden resting on the river, McCook holding the right, and Thomas the center. The confederate army, under gen. Bragg, was in position on the e. of Stone river, Breckenridge holding the right of the line, Polk the center, and Hardee the left. The battle began on the morning of Dec. 31 with a sharp attack by Crittenden on the enemy's right; but Rosecrans's plans were at once disturbed by his own right being driven in by the confederate left under Hardee. This movement necessitated the abandonment of the original design, and Rosecrans drew in his lines to support the center and right of his position, which became heavily engaged. The union line had lost its ground and 28 pieces of artillery, when nightfall put an end to the fighting for that day. Jan. 1 passed without any serious engagement, but on the afternoon of Jan. 2 the confederates made an attack in force, which was repulsed, and their lines were in turn driven in and badly broken up. There was no fighting on the 3d, and on the following day the confederates evacuated Murfreesboro'. The union strength in this battle was 43,400 men; loss, 1533 killed, 7,245 wounded, 3,000 prisoners. The confederates lost 10,000 killed, wounded, and missing out of 35,000 men.

MURGAB, a river of Central Asia, which rises on the northern border of Afghanistan, in the Hindu Kush, immediately to the n. of the sources of the Heri, (q.v.). The Murgab flows westward, then north-westward, and finally northward, passing from amongst the mountains in which it has its source into the desert plains of Turkestan, where the volume of its water gradually diminishes, until it finally loses itself in a swamp in the sandy plain of Merv, after a course of about 400 miles. In the upper part of its course it receives many tributaries, but none in the lower. The most noteworthy place on its banks is Merv, or Meru (anc. *Antiocheia Margiana*), a town of independent Turkestan, about 300 m. s.e. from Khiva. Merv was an important town in the days of the Seljuk dynasty, of which it was the capital, but is now very ruinous.

MURGER, HENRY, 1822–61, b. Paris; received a rudimentry education, and in 1838 became secretary to count Tolstoy, a wealthy Russian nobleman residing in Paris. While in his employ he became ambitious to become a writer, and began by composing satirical poetry. Uniting with a number of young artists, authors, and others of tastes similar to his own, he formed the irregular society or club to which he gave the name "Bohemia"; the associates being termed Bohemians, from their vagrant, gypsy life. They were adventurous and often brilliant, and bound by no ties, social or other. They soon made a name for themselves in Paris, and eventually in general literary history, on account of these features of their character and lives. Murger's reputation was established by the publication, in 1848, of his *Scènes de la Vie de Bohême,* a strikingly characteristic work, marked by independent thought, vigorous language, and occasional pathos. He contributed romance, to the *Revue des Deux Mondes,* and published *Les Nuits d'Hiver,* a volume of poems, besides writing small pieces for the Luxembourg theater.

MURIATIC ACID. See Hydrochloric Acid.

MU'RIDÆ, a family of rodent quadrupeds, containing many genera and a very large number of species, distributed over all parts of the world, and of which rats and mice may be regarded as typical examples. To this family belong also voles, lemmings, dormice, jerboas, marmots, etc. The muridæ are of the section of rodents having distinct clavicles. They have three or four molars on each side in each jaw, the molars at first furnished with rounded tubercles, which wear down till they exhibit mere roughened crowns. The typical muridæ, and those most nearly allied to them, have scaly tails. Marmots, dormice, jerboas, etc., have hairy tails. There are great diversities of structure and habits among the muridæ. All of them feed on vegetable food, but many of them are ready also to eat animal substances. The limits of the family muridæ are very differently stated by different naturalists.

MURIDÆ, (*ante*). The classification of this family of rodents varies. The marmots are there referred to the family, while by many they are placed in the family *sciuridæ* (squirrels). See Marmot, *ante*. Again, pouched rats, and North American gophers are classed by some with the muridæ, but by others are placed in the family *saccomydæ*. See Gopher. Jerboas are now generally regarded as constituting the family *dipodidæ*, instead of being confined to the genus *dipus*, of family muridæ. See Jerboa, *ante*. The family muridæ according to general consent, comprises rats, mice, lemmings, hamsters, muskrats or musquash and voles. See Rat, Mouse, Lemming, Hamsters, Musquash, and Vole, *ante*.

MURILLO, Bartholome Esteban, was b. at Seville, and baptized Jan. 1, 1618; and after receiving some education, was placed with his relative, Juan del Castillo, to study painting. Having saved a little money, which he made by painting religious pictures for exportation to South America, he went to Madrid in 1641, being then in his 24th year, was favorably noticed by his celebrated townsman, Velasquez, and through his influence, was enabled to study the *chefs-d'œuvre* of Italian and Flemish art in the royal collections. In 1645, he determined to return to Seville, though advised to proceed to Rome by Velasquez who offered him letters from the king. After settling in Seville, he received numerous important commissions, and was soon acknowledged as the head of the school there. In 1648, Murillo married a lady of fortune; he now maintained a handsome establishment, and his house was the resort of people of taste and fashion. The academy of Seville was founded by him in 1660, but he filled the office of president only during the first year. He fell from a scaffold when painting in Cadiz on an altar-piece for the church of the capuchins, returned to Seville, and soon after died from the injury he received, April 8, 1682. In early life, he painted many pictures illustrative of humble life; in these, the manner was darker and less refined than that exhibited in his later pictures, which are mostly scriptural or religious pieces. In the Louvre, and in England, there are about forty of his works. Sir David Wilkie, who greatly admired and carefully studied the Spanish school, has remarked, in reference to it: "Velasquez and Murillo are preferred, and preferred with reason, to all the others, as the most original and characteristic of their school. These two great painters are remarkable for having lived in the same time, in the same school, painted for the same people, and of the same age, and yet to have formed two styles so different and opposite, that the most unlearned can scarcely mistake them; Murillo being all softness, while Velasquez is all sparkle and vivacity."

MU'RO, an episcopal t. of s. Italy, in the province of Potenza, 17 m. n.w. of the t. of Potenza. Its castle, built on a height overlooking the ravine, was the scene of the murder of Joanna I., queen of Naples. Pop. 8,388.

MUROM', or Moorom, a t. in the s.e. of the government of Vladimir, in European Russia, 70 m. e s.e. of Vladimir, and situated on the right bank of the Oka, a tributary of the Volga. Pop. '67, 11,286. The chief industrial establishments are tanneries and sail-cloth and linen factories. The fisheries on the Oka supply the surrounding country. Murom is also noted for its orchards and kitchen-gardens, the latter of which supply a great portion of Russia with cucumber-seed of the first quality. Gypsum quarries in the neighborhood are extensively worked during winter. There is a large trade in wheat, flax, linseed, and timber. Murom has a very picturesque appearance, and was formerly surrounded by impenetrable forests. It is frequently mentioned in the old national ballads, and is one of the most ancient towns of Russia.

MURPHY, Arthur, 1727-1805; b. in county Roscommon, Ireland; educated at St. Omer's college (1740-47), and spent two years in Cork in business. He then went to London and entered upon his career as literary man, dramatist, and actor. From 1752 to 1754 he published a periodical called *The Gray's Inn Journal*, and afterwards a political journal, *The Test*, both unsuccessful. As an actor he appeared at Covent Garden and Drury Lane theaters, but did not meet with much favor. He now adopted the study of law and began practice in 1757, but once more with little success. He had already published a farce, *The Apprentice*, which had some popularity, and now occupied himself entirely in writing farces and comedies. In this he gained some wealth and a high reputation as a dramatist. Among the most successful of his pieces were: *The Upholsterer; The Way to Keep Him; All in the Wrong;* and *Know your own Mind* In 1792 he published an essay on Dr. Johnson, and soon after a translation of Tacitus: his life of Garrick was printed in 1801. A few years before his death a pension of £200 and the office of commissioner of bankrupts were bestowed on him by the English government.

MURPHY, Henry Crude, b. Brooklyn, N. Y., 1810; graduated at Columbia college in 1830; studied law, and was admitted to practice in 1833. He was made city attorney of Brooklyn, and was elected mayor in 1842. He was chosen to congress in 1843; and continued a member of that body during the next six years; being also a member of the N. Y. state constitutional convention in 1846. In 1857 he was appointed minister to Holland, where he remained until 1861, and where he added to his already comprehensive knowledge of Dutch history in its relation to that of the state of New York. He has gained distinction, both for his research and his literary skill in this department. He contributed to the periodicals in early life, and translated important writings from the Dutch for the *N. Y. Historical Collections*. He also translated, and published in 1865, specimens of the writings of the early Dutch poets of New Netherlands. Mr. Murphy has filled the position of president of the New York and Brooklyn bridge company from its formation.

MURRAIN is the generic term loosely used to designate a variety of diseases of domestic animals, but more correctly restricted to the vesicular epizootic, popularly known as the mouth and foot disease. It is a contagious eruptive fever, affecting cattle, sheep, pigs, and poultry; but rarely communicable to horses or men. It is characterized by the appearance of little bladders or vesicles in the mouth, on the lips, gums, and tongue; on the udder, and in the interdigital space; causing inability to eat, and driveling of saliva, heat and swelling of the udder, and lameness. The disorder runs a fixed and definite course usually in eight or ten days. Good nursing, comfortable lodgings, and a liberal supply of soft, easily digestible food, are the chief requisites for speedy recovery. A laxative may be given if needed. The mouth may be washed out twice daily with a mild astringent solution, which may be made with half an ounce of alum, oxide of zinc, or sugar of lead, to the quart of water. The udder in milch cows, in which the complaint is usually most serious, should be bathed with tepid water before and after milking, which must be attended to very regularly; and the feet kept clean, and washed occasionally with the lotion used for the mouth.

MURRAY, a co. in n.w. Georgia, adjoining Tennessee, bounded on the s.e. by the Coosawattee river, and on the w. by the Connasauga; 450 sq.m.; pop. '80, 8,269—8,257 of American birth, 907 colored. The surface is irregular and mountainous, and much of it heavily wooded. Gold and silver are found in some parts. The soil in the lower lands is fertile, and produces large crops of Indian corn, wheat, and oats. Smaller crops of tobacco and cotton are raised, and considerable molasses is made from sorghum. Co. seat, Spring Place.

MURRAY, a co. in s.w. Minnesota, drained by Shetek lake in the n., lake Talcot in the s., and other small lakes; 720 sq.m.; pop. '80, 3,604—2,897 of American birth. It is drained by the Des Moines and Rock rivers, the Channarambe and Oksida creeks. Its surface stretches out into broad level prairie land, tillable and adapted to grain culture, but nearly destitute of timber. It produces wheat, Indian corn, and oats; and furnishes good pasturage through the year. Co. seat, Currie Court-House.

MURRAY, Alexander, 1755–1821; b. Md.; went to sea as a boy, and when not yet of age was in command of a merchant vessel. In 1776 he was commissioned lieut. in the navy of the United Colonies, and, no vacancy then existing in the list of ships afloat, he served until the end of 1777 in the army as lieut. and capt., and was present at the battles of Flatbush and White Plains. In the year last-named he took command of a privateer, and on several letters-of-marque distinguished himself in many naval combats. He was taken prisoner, exchanged, and served as lieut. in the *Trumbull*, and in the engagement with the *Iris* was severely wounded and again made a prisoner, exchanged, and once more joined the service as lieut. of the frigate *Alliance*. In all he was in no less than 13 battles on land and sea. He became capt, in 1798, and commanded the *Montezuma* and *Constellation*, being engaged with the latter in the Tripoli war. For some time before his death he had command of the Philadelphia navy-yard.

MURRAY, Alexander, d.d., 1775–1813; b. Scotland; son of a shepherd. In his early life he showed a great desire for learning, and by the family hearth in the evening or amid his flock on the hill-side during the day he read with avidity the few books in his father's house. In 1789 he attended a school at Minnigaff. The next five years were spent in school in summer, teaching the children of the neighboring families in winter. Books were bought or borrowed; grammars and dictionaries of several languages were studied. He obtained a knowledge of the French, Latin, Greek, and Hebrew languages, and of the Anglo-Saxon, Welsh, and Arabic alphabets, and wrote a volume of poems. At the age of nineteen he entered the university at Edinburgh through the assistance of the rev. Dr. Baird of that city, who had heard of his remarkable proficiency. At the end of two years he began to study for the ministry. He contributed several articles to *Scot's Magazine* and the *Edinburgh Review*. He learned thoroughly all the European languages, and the Geez, Amharic, and Abyssinian dialects. The knowledge of the latter prepared him to edit *Bruce's Travels*, and in three years the edition appeared in 7 vols., with a life of the author, and copious philological and antiquarian notes. In 1806 he was ordained and installed assistant and successor to the minister of Urr in the stewardcy of Kirkcudbright. In 1811 he was employed to translate a Geez letter, which had been sent to the king from the governor of Tigré. In 1812 he was elected professor of oriental languages in the university of Edinburgh. During that year he published a small work entitled *Outlines of Oriental Philology, comprehending the Grammatical Principles of the Hebrew, Syriac, Chaldee, Arabic, and Abyssinian languages.* He now began a work entitled *History of the European Languages, or Researches into the Affinities of the Teutonic, Greek, Celtic, Sclavonic, and Indian Nations*, but before the end of the first session, his health which had been feeble for some time, utterly failed, and he died in the 37th year of his age.

MURRAY, Alexander, b. Penn., 1816; entered the navy in 1835. and was made lieut. in 1847. During the Mexican war he was stationed off the e. coast of Mexico, was wounded at Alvarado, and took part in the capture of Vera Cruz and Tabasco. He was attached to the coast survey 1846–9, and 1857–9. He became a commander in 1862, and the same year was in the engagements off North Carolina—Roanoke island, Newbern, Kinston, etc. In May of that year he led a naval expedition up the Pamunkey and York rivers. He was made commodore in 1871.

MURRAY, David, ph.d., ll.d.; b. Delhi, N. Y., 1829; graduated at Union college 1852; was professor and principal of the Albany academy 1853–63; and 1863–73 professor of mathematics and physics in Rutgers college. In 1873 he went to Japan as an expert to advise the Japanese government in regard to educational methods, where he still remains. He published *Manual of Land Surveying*, contributed to Mori's *Education in Japan*, and was the editor of *Outline History of Japanese Education.*

MURRAY, or **MORAY,** James Stewart, Earl of, sometimes called the "Good Regent," was the natural son of James V. of Scotland, by Margaret, daughter of John, fourth lord Erskine, afterwards wife of sir Robert Douglas of Lochleven. He was b. about 1531, made commendator of the priory of St. Andrews in 1538, and subsequently of the priory of Mâcon (in France). He joined the reformers in 1556, and almost immediately became the chief of the Protestant party in Scotland. In 1561 he was sent to France, to invite queen Mary to return to her kingdom; and on her arrival he became her prime minister and adviser. In Feb., 1562, he was created earl of Mar; but that earldom having been claimed by lord Erskine, the title of earl of Moray was conferred upon him instead a few months afterwards. Strongly opposed to the marriage of Mary with lord Darnley, July 29, 1565, he endeavored to oppose it by an appeal to arms; but he was easily put to flight by the queen, and obliged to take refuge in England. He did not return to Edinburgh till March 10, 1566, the day after the assassination of Riccio, in which he was an accomplice. In April, 1567 he went to France, but was recalled in August of the same year by the lords in arms against the queen, when he found Mary a prisoner in Lochleven, and himself appointed regent of the kingdom. After the escape of the queen he defeated her forces, May 13, 1568, at Langside, near Glasgow, and was afterwards one of the commissioners sent to England to conduct the negotiations against her. By his prompt and vigorous measures, zeal, and prudence, he succeeded in securing the peace of the kingdom, and settling the affairs of the church, but was assassinated at Linlithgow by Hamilton of Bothwellhaugh, Jan. 23, 1570.

MURRAY, John, the name of three generations of English publishers, will forever remain associated with the palmiest days of English literature in the 18th and 19th centuries. The founder of the house, John M'Murray, was born in Edinburgh about 1745. He obtained a commission in the royal marines in 1762, and in 1768 was still second-lieut., when, disgusted with the slowness of promotion, and panting for a more active career, he purchased the bookselling business of Mr. Sandby, opposite St. Dunstan's church, London, and, dropping the Scottish prefix, became a bookseller and purchaser at "32 Fleet street." He brought out the *English Review*, and published the elder Disraeli's *Curiosities of Literature*, etc. He could himself wield the pen, as some pamphlets remain to testify. He died Nov. 16, 1793, and was succeeded in due time by his son John, who was left a minor of 15 at his father's death. One of the earliest hits of John the second was Mrs. Rundell's cookery-book, which proved to be a mine of wealth—more productive, perhaps, than *Childe Harold* itself. He became connected with Thomas Campbell and sir Walter Scott, and in 1808–9 projected the *Quarterly Review*, a tory organ, in opposition to the Whig *Edinburgh Review*, then in the height of its influence. The first number was published Feb. 1, 1809, under the editorship of William Gifford. The new periodical was completely successful, and brought Murray into communication not only with the chief literati, but also with the conservative statesmen of the time. A still more fortunate acquaintance was that with lord Byron, whose *Childe Harold* was published by Murray in 1812. Murray now removed from Fleet street to Albemarle street, where the business is still carried on. Here Byron and Scott first met, and here Southey made the acquaintance of Crabbe. Almost all the literary magnates of the day were "four o'clock visitors" in Albemarle street. Byron's pleasant verse has described the scene:

> "The room's so full of wits and bards,
> Crabbes, Campbells, Crokers, Freres and Wards."

Murray's dinner-parties included politicians and statesmen, as well as authors, artists, and dilettanti. Murray paid Byron nearly £20,000 for his works, and his dealings with Crabbe, Moore, Campbell, and Irving were princely. The second John Murray died in his 65th year, in 1843, and was succeeded by his son, JOHN MURRAY the third. Born in 1808, he was educated first at the charter house, and afterwards at Edinburgh university. The age of Byron had gone by, when, in 1843, he succeeded to the business of his father and grandfather. A more practical and realistic age had succeeded, and the "home and colonial library," issued to beat off foreign and American piracies, was the precursor of the cheap railway and other literature of the present day. A lively and vigorous competition, arising out of the wants of a new era, has somewhat altered the relation of the great publishing houses. That of Albemarle street no longer ranks first in the extent and variety of its transactions, but many of the greatest works in history, biography, travel, art, and science have issued from the Albemarle street press under the regimé of the third Murray. Among his later successes may be mentioned Dr. Livingstone's *Travels* and *Last Journals*, Smiles's *Life of George Stephenson*, and Charles Darwin's *Oirgin of Species by Natural Selection*. His handbooks of continental travel have lately been supplemented by handbooks of English counties, and these, it is understood, owe much to the personal assistance and superintendence of the present head of the famous house of Murray.

MURRAY, JOHN, 1741–1815; b. Alton, England. At the age of 11 his parents removed to Cork, Ireland. He became a Methodist under the preaching of Wesley and Whitefield. Having read a book by James Relly, a Universalist, he was led to adopt his views. For this he was excommunicated at Whitefield's tabernacle, London. Persecution for opinion, pecuniary embarrassment, and grief for the loss of his wife, made him very unhappy, and he resolved to seek retirement and relief in America. He preached his first sermon in America Sept. 30, 1770, in a small church, in an obscure place in New Jersey, called "Good Luck." Believing fully in the doctrine of universal salvation, he gave himself to earnest labor, first in New Jersey and New York, afterwards in Newport, Providence, Boston, Portsmouth, Norwich, and other places in New England. In 1774 he fixed his residence in Gloucester, Mass., where he was represented as a papist, and a secret emissary of lord North in the interest of the English ministry. He was abused, and by a vote ordered to leave the town, but the interference of powerful friends saved him, and he was allowed to remain. In 1775 he was appointed chaplain of a Rhode Island brigade encamped near Boston. The other chaplains petitioned for his removal, but Washington disregarded the petition, and even showed him marked attention. Ill health required him to leave the army, and he returned to Gloucester, where he was settled over a society of Universalists. Converts to his views multiplied. He was instrumental in the organization of a convention of his sect, which met at Oxford, Mass, Sept. 1785, and took the name of Independent Christian Universalists. In 1787 he visited his native land, and preached in many places with great acceptance and power. Returning before the close of the year, he attended a convention of Universalists held in Philadelphia in 1790. In 1798 he was installed pastor of a society of Universalists in Boston, where he remained the rest of his life. He was buried in the Granary burying-ground, Boston, whence his remains were removed June 8, 1837, to Mount Auburn, where an appropriate monument is erected to his memory. He is regarded as the father of Universalism in America. He published *Letters, and Sketches of Sermons*, with an autobiography, 3 vols. He is described as possessing a "poetical imagination, a retentive memory, warm affections, and a love for all mankind." In his public discourses he spoke with "great grace of oratory, a good choice of words, and a great variety of expression." Except on the one point of universal salvation his views were in harmony with those commonly called evangelical, especially in regard to the proper divinity of Jesus Christ.

MURRAY, LINDLEY, an English grammarian, was b. at Swatara, Lancaster co., Penn., U. S., in 1745. He was educated at an academy of the Society of Friends, and, on his father's removal to New York, was placed in a counting-house, from which he escaped to a school in New Jersey. He then studied law, and was admitted to the bar at the age of 21, and commenced a good practice. During the revolutionary war he engaged in mercantile pursuits with such success as to accumulate a handsome fortune. His health failing, he came to England and purchased the estate of Holdgate, near York, where he devoted himself to literary pursuits. In 1787 he published his *Power of Religion on the Mind*, which passed through seventeen editions. His *Grammar of the English Language* was issued in 1795, and was followed by *English Exercises*, the *Key*, the *English Reader, Introduction and Sequel*, and a *Spelling Book*. There can be no stronger indication how entirely the systematic study of the English language was—until recent years—neglected by scholars, than the fact that Murray's grammar was for half a century the standard text-book throughout Britain and America. Murray wrote an autobiography to the year 1809, which was published after his death, Feb. 16, 1826.

MURRAY, NICHOLAS, D.D., 1803–61; b. Ireland; trained in childhood by his parents and other relatives in the Roman Catholic faith; acquired the rudiments of education in a village school; in his twelfth year came to New York and obtained employment in the house of Harper & Bros.; 1820 became a member of the Brick Presbyterian church, and, influenced by the advice of his pastor, Dr. Gardner Spring, prepared for and entered Williams college, graduating there 1826, and at Princeton theological seminary 1829; in 1830 became pastor of the Presbyterian church at Wilkesbarre, Penn., and, in 1833, of the First Presbyterian church of Elizabethtown, N. J., where—declining numerous calls to important cities north, south, east, and west, and two theological professorships—he continued until his death. His personal appearance was attractive and commanding; his winning manners, abundant information, and sparkling wit made him the life of the social circle; his intellect was clear, logical, and comprehensive, and his style simple, racy, and incisive; his preparations for the pulpit were completely and yet so promptly and systematically made that he often had many sermons waiting their turn to be preached; his pastoral visitations were abundant in the abodes of the poor, the chambers of the sick, and the cheerful homes of his people; his correspondence—literary, advisory, and fraternal—was almost unlimited; with untiring industry he contributed ably and constantly to the weekly press, one series of articles published first in the *New York Observer*—*Kirwan's Letters to Bishop Hughes*—have obtained a circulation unequaled in religious literature, and have been translated into French, Spanish, Italian, German, and Tamil. His other published writings in book form are numerous.

MURRAY, WILLIAM. See MANSFIELD, Earl of, *ante*.

MURRAY, WILLIAM HENRY HARRISON, b. Conn., 1840; graduated at Yale college in 1862 and from the Yale theological in 1864, when he became pastor of a Congregational church in Greenwich, Conn., where he remained two years. He then removed to West Meriden in the same state, whence, after two years more, he was called to the Park street church in Boston. His sermons and lectures began at once to attract general attention, and from 1870 to 1874 he was one of the most popular preachers in Boston. During these years he also delivered several lectures in New England and the west, and published *Music Hall Sermons; Camp Life in the Adirondacks; Words Fitly Spoken*, and *The Perfect Horse*. In 1874 he resigned his pastorate of the Park street church, but continued to preach a year or two in Music hall to a congregation which included a part of his former one. In 1876 he established *The Golden Rule*, a religious weekly newspaper. He afterwards became practically interested in the manufacture of carriages, but soon met with losses and mercantile embarrassment. In 1879–80 he was in England, chiefly in Liverpool, engaged in business. In 1880–81 he visited Texas, looking over the state with a view to colonizing enterprises; and it was his intention to remain for some time.

MURRAY, WILLIAM VANS, 1762–1803; b. Md.; studied law in the Middle temple, London, and on his return was chosen a member of the Maryland legislature. He was in congress 1791–97, taking a prominent part in the debates. In 1797 he was appointed minister to Holland, and two years later envoy to France, where, in association with Oliver Ellsworth and William R. Davis, he negotiated a treaty with France, between which and this country there had been a long controversy. He resumed his post at Holland, but resigned in 1801. He published a work on the constitution and laws of the United States.

MURRAY, or MORAY, Sir ROBERT; d. 1673; b. Scotland; entered the French army, in which, by the influence of Richelieu, he obtained the rank of colonel. On his return to Scotland he formed a plan for the escape of Charles I., which came to nothing through the king's irresolution. He is next heard of in 1651, when he was appointed justice-clerk, and soon afterwards he was made a privy councilor and a lord of the session, but he never took his seat upon the bench. He is best known as one of the founders of the Royal Society, which was a continuation of a debating club, which used to meet in London to discuss the "new philosophy," and which obtained a royal charter in 1662.

MURRAY RIVER, the principal river of South Australia. See AUSTRALIA.

MURSHEDABAD', a t. of India, capital of a British district of the same name in Bengal proper, is situated on the left bank of the Bhagratti, a branch of the Ganges, about 124 m. n. of Calcutta. On the opposite side of the river stands Mahinagar, usually reckoned a part of Murshedabad. The town occupies a great space, being several miles both in length and breadth, but the buildings are for the most part of mud. It contains two palaces: the one, old and gloomy; the other, constructed after the European style, and of great beauty, was completed in 1840. Situated on the most frequented route by water from Calcutta to the North-West provinces. The trade of Murshedabad is important. Formerly it was the capital of Bengal, and so wealthy that Clive compared it with London. Pop. ('71,) 46,182, of whom about 60 per cent are Hindus, and 40 per cent Mohammedans.

MURVIE'DRO, a small t. of Spain, in the province of Valencia, and 18 miles n.n.e. of the city of that name, on the left bank of the Palancia, and two miles from its mouth. Pop. about 5,000. It stands on the site of the ancient Saguntum (q.v.).

MURZUK'. See FEZZAN.

MUSA'CEÆ, a natural order of endogenous plants, the largest of herbaceous plants, generally destitute, or almost destitute of true stems, yet resembling trees in appearance, and sometimes rivaling palms in stateliness; the long sheathing bases of the leaf-stalks combining to form a false stem. The blade of the leaf has many fine parallel veins proceeding from the midrib to the margin. The flowers are congregated on spadices, which are protected by spathes. The fruit is either a 3-valved capsule or fleshy.—The species are not numerous; they are natives of warm climates, in which they are widely distributed, and are of great value to the inhabitants of tropical countries; the fruit of some, particularly of the genus *Musa*, being much used for food, whilst the fibers of the leaves are employed for cordage and for textile purposes. See PLANTAIN, BANANA, and ABACA. A very interesting plant of the order musaceæ is the traveler's tree (q.v.) of Madagascar.

MUSÄUS, JOHANN KARL AUGUST, a German writer, b. in 1737 at Jena, where he studied theology, was nominated to a country church, but prevented from entering upon the cure committed to him in consequence of the opposition of the peasantry of the parish, who refused to receive him on the ground that he had been once seen to dance. In 1763 he received the appointment of tutor to the pages at the ducal court, and in 1770 he became professor at the Weimar gymnasium. His first literary production, which appeared in 1760, was a parody of Richardson's *Sir Charles Grandison*, which was at that time extravagantly admired in Germany. The success of this satirical squib was complete; but as literary fame did not bring with it a corresponding amount of pecuniary reward, Musäus was compelled to gain his living by other means than writing; and an interval of more than 18 years elapsed before he found leisure to reappear as an author. In 1778 he published his *Physiognomischen Reisen*, in which he endeavored, by a good-natured yet striking satire, to counteract the absurd uses to which the Germans of his day had turned Lavater's system. This, like his previous work, was pre-eminently successful; and, encouraged by the marks of popular favor with which it was received, he laid aside his incognito. and continued to devote himself to authorship. In 1782 appeared his charming version of German folk-lore, under the title of *Volksmärchen der Deutschen*, which professed to be merely a collection of popular tales, noted down from the lips of illiterate old country people; but these tales were tinctured with such a blending of genial humor, quaint fancy, and strong sense, that they have become a classical work of their kind, popular among persons of every age and class. His satirical sketches, entitled *Freund Heins Erscheinungen in Holbein's Manier* (Winterthur, 1785), maintained his reputation as one of the sprightliest and most genial satirists of his country. Under the name of Schellenberg, he began a course of tales, *Straussfedern* (Berl. 1787), which, however, he did not live to complete. He died in 1787. His *Moralische Kinderklapper* appeared the year after his death, while his other posthumous writings were edited in 1791, with an interesting notice of the author, by his relative and pupil, A. V. Kotzebue. Musäus's style was at once correct and elegant, adapting itself with singular flexibility to the various subjects which he handled; while the unaffected geniality and frank loving nature which are reflected in all he wrote, have deservedly made him one of the most popular writers of his day in Germany.

MUSÆ'US, one of the ancient Greek poets of the mythic period, is said to have been the son of Eumolpus and Selene; according to others, the son and pupil of Orpheus. To him was ascribed the introduction of the Eleusinian and other mysteries into Greece, and the ordering of many religious rites. He was among the ancients also the reputed author of a number of poems, oracles, purificatory verses, a war of the Titans, a theogony, hymns, etc.; but of the few verses which remain the authenticity is very doubtful. A later MUSÆUS, who probably flourished about the end of the 6th c. of the Christian era, was the author of a very pleasing amatory poem, in Greek, entitled *Hero and Leander*, discovered in the 13th c., of which the first edition was published by Aldus Manutius about 1494, and of which there have been many subsequent editions.

MUSCADINE GRAPE, a species that grows in the extreme southern states where it is known as the Bullitt grape. The technical term given it by Linnæus is *vitis vulpina.*

MUSCÆ VOLITANTES is the term applied to ocular spectra, which appear like flies on the wing, or floating black spots before the eyes. There are two kinds of muscæ volitantes—the one a perfectly harmless kind, while the other is symptomatic of one of the most serious diseases of the eyes, viz., amaurosis.

Whoever will look through a minute pin-hole in a card at the clear sky may see floating before his sight a number of translucent tubes or fibers, and many little beads, of which some are separate, some attached to the tubes, and some apparently within them. Some of the tubes or fibers are straight, others looped or twisted, and others again forked. All these objects are bright in the middle, and bounded by fine black lines, beyond and parallel to which may be seen an appearance of colored lines or fringes. The doublings and crossings of the loops or knots in the twisted fibers appear as black points. Though the eye be fixed, these bodies change their position with greater or less rapidity. Now, in ordinary light and vision all these objects are imperceptible, unless the knots or fibers happen to be larger than usual, when they constitute the harmless kind of muscæ volitantes. The black lines and fringes are phenomena of the inflexion or diffraction (q. v.) of light, which are never seen except in divergent rays, and all muscæ volitantes having such fringes must be situated at a greater or less distance from the retina; and there are conclusive reasons for believing that they occupy the vitreous humor, and cannot therefore portend amaurosis; whereas those black spots which have no fringes, and which do not move, or which move only with the motions of the eye, are points in the retina which are insensible to light, and are therefore to be dreaded as symptomatic of danger to vision. To decide, then, whether the muscæ volitantes are or are not indicative of danger, the patient should fix his eye on a white surface (as a sheet of letter-paper) after a sudden shake of the head; if they sink gently downwards, they are innocent. It should perhaps be added, that though they seem to descend, they must in reality be ascending; floating up in the vitreous humor as far as the cellular partitions formed by the hyaloid membrane will permit. See Eye. For further information on the differences between the innocent and the dangerous forms of muscæ volitantes, the reader is referred to an article by sir David Brewster in the *North British Review* for Nov., 1856.

MUS'CARDINE, or Silk-Worm Rot (*Botrytis Bassiana*), a fungus (see Botrytis) which grows on silk-worms, and often kills them in great numbers. It consists of erect branching threads, with clusters of spores at the end of short lateral branches. The spores of this fungus germinate even on healthful silk-worms, and in circumstances otherwise most favorable to their healthfulness. They germinate also on the caterpillars of other lepidopterous insects. When this pest appears among silk-worms, its progress cannot be checked by any means known. For prevention, it is most important that the silk-worms be not overcrowded.

MUSCAT', or Maskât, an independent Arab state, forming the sea-cost of Omân, in Eastern Arabia. It extends from the strait of Ormus to the island of Moseirah, and nowhere exceeds 150 m. in width. The coast and interior are both sterile, but the country is studded with very fertile oases. The capital is Muscat; pop., 60,000, on the Persian gulf, a fortified town, surrounded with gardens and date-palms. It has a very good harbor, which, in the winter months, is reckoned the best refuge in the Indian ocean, and is a most important center of trade, where the productions of Europe, of Africa, and of the east are exchanged. The principal exports are Arabian coffee and pearls obtained from the Persian gulf; but wheat, dates, raisins, salt, sulphur, drugs, and horses are also exported. The independence of Omân dates from 751, when the people elected a sovereign of their own. For 900 years the Imaums were elected for personal merit, and afterwards from members of a ruling family. Muscat was taken by Albuquerque in 1507, and remained in the hands of the Portuguese till 1648, when the Arabs recovered possession of it. The Imaums afterwards made extensive conquests in eastern Africa, including Zanzibar, Mombas, Quiloa, etc. In 1798 they acquired possession of the coasts of Laristan and Mogistan, the islands of El Kishim and Ormus, and the town of Bender Abbas in Persia, paying to the shah a rent or tribute of 6,000 tomans. The state was very prosperous under the wise and mild sway of Said Seid, the late Imaum. He ascended the throne in 1803, at the age of 16, and reigned till his death in 1856. He was long a faithful ally of England. In 1854 the Imaums were driven from their Persian dependencies, which in their opinion belonged to them in perpetuity so long as they paid the rental. They recaptured Bender Abbas, but in consequence of English interfence, they were compelled to conclude a treaty with Persia in April 1856. This is said to have broken the heart of the old Seid, who died Oct. 19, 1856. He appointed his son Majid to succeed him in Zanzibar, and his son Thuwany to succeed him in Muscat. The latter was murdered by his son Salim in 1868, who reigned for a short time, but was driven out by his uncle Sayed Tuky. In consequence of the unsettled state of affairs in Muscat, Persia has assumed the government of Bender Abbas and the Persian coast territory. See Zanzibar and Wahabis.—See *History of the Imaums and Seyids of Omân*, by Sahib-ibn-Razik, from the Arabic, by Rev. G. P. Badger (1781); Markham's *History of Persia* (1874).

MUS'CATEL (Ital. *moscado*, musk), the name given to many kinds of sweet and strong French and Italian wines, whether white or red. Amongst the finest are the white Rivesalt and red Bagnol wines from Roussillon, and the Lunel from the Pyrenees, the Lacrymæ Christi and Carigliano of Naples, etc.

MUSCATINE', a co. in s. e. Iowa on the Mississippi river; 440 sq.m.; pop. '80, 28,168—19,192 of American birth. The surface is varied, and the soil fertile. There are rich deposits of coal, and quarries of freestone and limestone. The chief productions are corn, wheat, rye, barley, oats, and wool. The chief articles of manufacture are carriages, metal-ware, boots and shoes, and clothing. There are also saw, flour, and planing-mills, breweries and machine shops. The Burlington, Cedar Rapids, and Northern, and the Chicago, Rock Island, and Pacific railroads pass through it. It is drained by the Cedar river. Co. seat, Muscatine.

MUSCATINE', a city of Iowa, U.S., is on the w. bank of the Mississippi, 100 m. above Keokuk, and 32 s.e. of Iowa city. It has a large trade by the river, and several railroads, three steam-flour mills, planing-machines, four large saw-mills, which annually produce about 30,000,000 ft. of timber, besides shingles, etc. There are 14 churches, schools, newspapers, etc. Pop. '70, 6,718.

MUS'CHELKALK (Ger. shell-lime), the middle member of the triassic, or new red sandstone period, the beds of which are entirely absent from the British strata. Being typically developed in Germany, the foreign name has been universally adopted to designate them. They consist of (1st) a series of compact, grayish, regularly-bedded limestone more than 300 ft. thick; and (2d) alternations of limestone, dolomite, marl, gypsum, and rock-salt, nearly 300 ft. thick. The limestone abounds in the remains of mollusca. The paleozoic goniatites are replaced by the ceratites, a remarkable link between them and the secondary ammonities. Ceratites are distinguished by the few small denticulations of the inner lobes of the suture. The heads and stems of lily encrinites (*Encrinus*) are also abundant in these strata, and the remains of ganoid fish have also been met with.

MUSCI. See MOSSES.

MUSCICA'PIDÆ, a family of birds of the order *insessore* and tribe *dentirostres*, of which the greater number receive the popular name fly-catcher (q.v.). The limits of the family are, however, very variously defined by different ornithologists. The muscicapidæ are mostly inhabitants of the warmer parts of the world, in which they are very widely diffused. The species are very numerous.

MUSCIDÆ, a family of dipterous insects, having a short, thick, membranous proboscis, geniculated at the base, entirely retractile so as to be concealed within the mouth, and terminated by two large lobes (see HOUSE-FLY); the antennæ three-jointed; the thorax with a transverse suture. The species are very numerous, and universally distributed. More than 800 are found in Britain, among which are the well-known house-fly, blow-fly, etc. The larvæ are maggots (q.v.). Although some of the muscidæ are troublesome, none of them are so much so as species of some other allied families.

MUSCLE AND MUSCULAR TISSUE. Muscular tissue is specially distinguished by its contractile power, and is the instrument by which all the sensible movements of the animal body are performed. When examined under a high magnifying power, the fibers of which it is composed are found to exist under two forms, which can be distinguished from one another by the presence or absence of very close and minute transverse bars or stripes. The fibers of the *voluntary* muscles—or those whose movements can be influenced by the will—as well as the fibers of the heart, are *striped;* while those of the *involuntary* muscles—the muscular structures over which we have no control—as, for example, the muscular fibers of the intestinal canal, the uterus, and the bladder, are *unstriped.*

On examining an ordinary voluntary muscle with the naked eye (a muscle from one of the extremities of any animal, for example), we observe that it presents a fibrous appearance, and that the fibers are arranged with great regularity in the direction in which the muscle is to act or contract (for it is by their inherent power of contracting that muscles act). On closer examination it is found that these fibers are arranged in *fasciculi*, or bundles of various sizes, inclosed in sheaths of areolar tissue, by which they are at the same time connected with and isolated from those adjoining them; and when the smallest *fasciculus* visible to the naked eye is examined with the microscope, it is seen to consist of a number of cylindrical fibers lying in a parallel direction, and closely bound together. These *primitive* (or, as some writers term them, the *ultimate*) fibers present two sets of markings or *striæ*—viz., a longitudinal and a transverse set. The fibers, when separated from each other, frequently split longitudinally into *fibrillæ*. Sometimes, however, when a fiber is extended, it separates in the direction of the transverse striæ into a series of disks. Either cleavage is equally natural, but the latter is the least common. Hence, observes Mr. Bowman, who has specially investigated the minute structure of voluntary muscle, "it is as proper to say that the fiber is a pile of disks as that it is a bundle of fibrillæ; but, in fact, it is neither the one nor the other, but a mass in whose structure there is an intimation of the existence of both, and a tendency to cleave in the two directions. If there were a general disintegration along all the lines in both directions, there would result a series of particles, which may be termed *primitive particles* or *sarcous elements*, the union of which constitutes the mass of the fiber. These elementary particles are arranged and united together in the two directions, and the resulting disks, as well as fibrillæ, are equal to one another in size, and contain an equal number of particles. The same particles compose both. To detach an entire fibrillæ is to extract a particle of every disk, and *vice versa.*" The fibers are supplied with vessels and nerves, which lie in the intervals between them, and are attached by their extremities through the medium of tendon or aponeurosis to the parts which they are intended to move. Aggregated in parallel series, of greater or lesser size, and associated with nerves, vessels, tendinous structures, etc., they form the various muscles which are for the most part solid and elongated, but are sometimes expanded into a membranous shape. The length of the fibers is usually about that of the muscle in which they may occur, and may vary from two feet or more (in the sartorius muscle) to less than two lines (in the stapedius muscle in the middle ear); while their width varies from $\frac{1}{80}$ to $\frac{1}{1800}$ of an inch, being largest in crustaceans, fishes, and reptiles, where their irritability, or property of contracting under the action of a stimulus, is most enduring, and smallest in birds where it is most evanescent. Their average width in man is about $\frac{1}{400}$ of an inch, being about $\frac{1}{388}$ of an inch in the male and $\frac{1}{454}$ of an inch in the female. The average distance between the striæ, or the size of the sarcous elements, in the human subject is $\frac{1}{9400}$ an inch, the extremes being $\frac{1}{15000}$ and $\frac{1}{8000}$ of an inch, according to the contraction or relaxation of the fiber. The form of the fibers is polygonal, their sides being flattened against those of the adjoining fibers. Each fiber is enclosed in a transparent, very delicate, but tough and elastic tubular sheath, which cannot always be readily seen, but is distinctly shown stretching between the separated fragments of a fiber which has been broken within it, for its toughness will often resist a force before which its brittle contents give way. This tubular sheath is known as the *sarcolemma* or *myolemma*—the former term being derived from the Greek words *sarx*, flesh, and *lemma*, a skin or husk; and the latter from the Greek words *mûs*, a muscle, and *lemma*.

It was for a long time believed that the contraction of a muscle was associated with a change in the direction of each fiber from a straight line to a sinuous or zigzag course. The investigations of Mr. Bowman, have, however, shown that this view is erroneous. He has proved that in a state of contraction there is an approximation of the transverse striæ, and a general shortening with a simultaneous thickening of the fiber, but that it is never thrown out of the straight line, except when it has ceased to contract and its extremities are acted on by the contraction of adjacent fibers.

Muscles grow by an increase, not of the number, but of the bulk of their elementary fibers; and Mr. Bowman believes "that the number of fibers remains through life as it was in the fœtus, and that the spare or muscular build of the individual is determined by the mold in which his body was originally cast."

The structure of the *involuntary* or *unstriped* muscles must now be considered. This form of muscular tissue most commonly occurs in the shape of flattened bands of considerable length, but of a width not exceeding $\frac{1}{1000}$th or $\frac{1}{3000}$th of an inch. These bands are translucent, and sometimes slightly granular, and are usually marked at intervals by elongated nuclei, which become much more apparent on the addition of acetic acid. Kölliker has shown that every one of these bands or fibres is either a single elongated cell (a fiber-cell) or is a fasciculus of such cells. These fibres have not usually fixed points of attachment like the striated fibres, but form continuous investments around cavities within the body—such as the intestinal canal, the bladder, the uterus, the blood-vessels, etc.—or are dispersed through the substance of tissues, such as the skin, to which they impart a contractile property.

The chemical composition of ordinary (or voluntary) muscle is described in the article **FLESH**. It is only necessary to add that the fibrillæ, or the sarcous elements of which they are composed, consist of a substance termed **SYNTONINE** (q. v.), which closely resembles the fibrine or coagulating constituent of the blood; and that the same syntonine is also the main constituent of the unstriped muscles, or at all events of their fibre-cells. Like the blood-fibrine, it exists in a fluid form in the living tissue, and only coagulates or solidifies after death.

Our limited space prevents even an allusion to the arrangement and distribution of blood-vessels, nerves, and areolar-tissue in muscular structures; and we therefore pass on to the consideration of the muscles and their functions.

Muscles vary extremely in their form. In the limbs they are usually of considerable length, surrounding the bones and forming an important protection to the joints; while in the trunk, they are flattened and broad, and contribute very essentially to form the walls of the cavities which they inclose. There is unfortunately no definite rule regarding the nomenclature of muscles. Muscles derive their names (1) from their situation—as the temporal, pectorals, glutæals, etc.; or (2) from their direction—as the rectus, obliquus, etc., of which there may be several pairs—as, for example, rectus femoris, rectus abdominalis, rectus capitis, etc.; or (3) from their uses—as the masseter, the various flexors, extensors; or, (4) from their shape—as the deltoid, trapezius, rhomboid, etc.; or (5) from the number of their divisions—as the biceps and triceps; or (6) from their points of attachment—as the sterno-cleido-mastoid, the genio-hyo-glossus, the sterno-thyroid, etc. In the description of a muscle we express its points of attachment by the words *origin* and *insertion*; the former being applied to the more fixed point or that towards which the motion is directed, while the latter is applied to the more movable point. The application of these terms is, however, in many cases arbitrary, as many muscles pull equally towards both attachments. Muscles opposed in action are termed *antagonists*, this antagonism being in most cases required by the necessity that exists for an active moving power in opposite directions. Thus, by one set of muscles, the *flexors*, the limbs are bent; while by a contrary set, the *extensors*, they are straightened. One set, termed the muscles of mastication, closes the jaws, while another set opens them; and probably every muscle in the body has its antagonists in one or more other muscles.

The skeleton, which may be termed the locomotive framework, may be regarded as a series of levers, of which the fulcrum is, for the most part, in a joint—viz., at one extremity of a bone—the resistance (or weight) at the further end, and the force (or muscle) in the intermediate portion. In most cases, in order to preserve the necessary form of the body, muscles are applied at a great mechanical disadvantage as regards the exercise of their power; that is to say, a much larger force is employed than would suffice, if differently applied, to overcome the resistance. The two main sources of this disadvantage lie in the obliquity of the insertion, and consequently of the action of most muscles, and in the muscles being usually inserted very near the fulcrum. The first of these disadvantages is in many cases diminished by the enlargements of the bones at the joints. The tendons of the muscles situated above the joint are usually inserted immediately below the bony enlargement, and thus reach the bone that is to be moved in a direction somewhat approaching the perpendicular. If this enlargement did not exist, the contraction of the muscle, instead of causing the lower bone to turn upon the upper one with comparatively little loss of power, would do little more than cause the two ends of the bones to press upon each other. The second mechanical disadvantage is compensated for by gain in the extent and velocity of movement, and by the avoidance of the great inconvenience of having the muscles extended in straight lines between the ends of jointed continuous levers. Thus the bones of the forearm are bent upon the bone of the arm by the biceps muscle which arises close to the head of the latter, and is inserted at a short distance from the elbow-joint, which acts as the fulcrum of the lever. By this arrangement, a contraction of a single inch in the muscle moves the hand, in the same time, through the extent of about twelve inches, but then the hand moves through every inch with only about the twelfth part of the power exerted by the muscle. By the junction of two or more levers in one direction, as in the different segments of the extremities, the extent and velocity of their united actions are communicated to the extreme one. Thus a blow of the fist may be made to include the force of all the muscles engaged in extending the shoulder, elbow, and wrist.

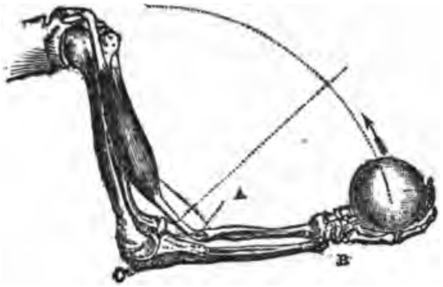


Fig. 8.

The great and characteristic property of muscular tissue—that of shortening itself in a particular direction when stimulated—is called *contractility*. The stimulus may be direct irritation by mechanical means, or by galvanism, or by some chemical substance, but in the living body the muscular fibres are, in most cases, made to contract by the immediate influence of the nerves distributed among them, which are consequently termed *motor* nerves (see NERVOUS SYSTEM), and are under the influence of the will. By an exertion of volition, we can contract more or fewer muscles at once, and to any degree, within certain limits; and as a matter of fact, there is hardly any ordinary movement performed in which several muscles are not called in play. But every voluntary muscle is also subject to other influences more powerful in their operation than the will. The movement of the features under the impulses of passion and emotion are more or less involuntary, as is shown by the very partial power the will has of restraining them, and the extreme difficulty of imitating them.

Many movements ensue involuntarily when certain impressions, which need not necessarily be attended with consciousness, are made on the surface of the body, or on any part of its interior, either by external or internal causes. Such movements are termed *reflex*, and are noticed in the article NERVOUS SYSTEM. Our space precludes us from noticing the individual groups of muscles in the human body. Several important groups are, however, noticed under ARM, EYE, FOOT, HAND, LEG, etc.

MUSCLE SHOALS, an expansion of the Tennessee river in Alabama, about 250 m. from its mouth, where fresh-water muscles are found in great quantities, and a series of rapids make the river unnavigable for nearly 25 miles. During that distance, the river falls 100 feet.

MUSCO'GEE, a co. in w. Georgia, bounded on the w. by the Chattahooche river, which divides it from Alabama, and on the s.e. by Upatoi creek; 375 sq. m.; pop. '70, 16,663, of which the greater part is colored. It is traversed by the South-western railroad of Georgia, and North and South railroad of Georgia. A part of the soil is very fertile; a part sandy, and portions of the county are covered with forests. The principal products are cotton and corn. The manufacturing interests are large, principally of cotton and woolen goods. Co. seat, Columbus.

MUSCOGEES-INDIANS. See CREEKS.

MUSCOVITE, the most common variety of mica (q.v.); synonyms—Muscovy glass, biaxial mica, oblique mica, potash mica, common mica, *verre de Muscovie*. Trimetric crystallization, usually in hemihedral forms, with a monoclinic aspect; hexagonal prisms; cleavage parallel to the base, and easily separated, forming very thin, elastic plates, which are used in stoves under the name of "isinglass," and in Russia in windows, whence called Muscovy glass. The leaves are sometimes aggregated together in stellate, plumose (plumose mica), or globular forms, or in scales, which are sometimes in masses. Hardness, 2 to 2.5; sp. gr., 2.75 to 2.31 (Dana). Luster, pearly; color, white, gray, pale green, violet-yellow, brown and dark olive-green, and the colors vary in axial and diametral directions. In transmission of light it ranges from transparent to translucent. In general terms it is a silicate of potash and alumina, containing iron, and frequently small quantities of manganese, and hydrofluoric acid (see FLUORINE, *ante*). A specimen from Uto, analyzed by Rose, gave: silica, 47.50; alumina, 37.80; peroxide of iron, 3.20; peroxide of manganese, 0.90; potash, 9.60; hydrofluoric acid, 0.56; it contained also 2.63 of water. A specimen from Abborfoss contained: silica, 39.45; alumina, 9.27; peroxide of iron, 35.78; magnesia, 3.29; potash, 5.06; fluorine, 0.29; calcium, 0.32, iron, 1.45, manganese, 2.57 = 90.59 (Svauberg). Mica fuses with some difficulty before the mouth of the blow-pipe to a grayish, blebby mass; easily dissolves in borax and phosphorus salt

Fine crystals of Muscovite occur in granite at Acworth, Grafton, and Alstead, N. H., the plates being sometimes 8 ft. across and perfectly transparent. It occurs in Massachusetts at Chesterfield with albite, and in brown, hexagonal crystals at the Middletown, Conn., feldspar quarry. At Warwick, N. Y., crystals and plates a foot and more in diameter occur in a vein of feldspar. In St. Lawrence co., 8 m. from Potsdam, on the road to Pierrepont, it occurs in plates 7 in. across; and near Saratoga in reddish brown crystals with chrysoberyl; on the Croton aqueduct, near Yonkers, in rhombic prisms, with transverse cleavage; in fine, hexagonal crystals of dark brown in Chester co., Penn.; in Philadelphia co., smoky brown, with hexagonal internal bands; and at Chestnut hill, near the Wissahickon, is a green variety. It is found in Maryland, at Jones's falls, 2 m. from Baltimore, and various other localities, for which see Dana's *Mineralogy*.

MUSCOVY. See Russia, *ante*.

MUSCOVY DUCK. See Musk Duck, *ante*.

MUSCULAR FORCE, Origin of. Until the year 1866 the universally accepted theory on this subject was that of Liebig. According to him, non-nitrogenous food is consumed entirely in the production of heat; while muscular energy is due to the waste of the nitrogenous muscular tissue, and therefore of nitrogenous food. Muscular exercise should, if this were the case, cause very distinct increase in the nitrogenous excretions of the body, as well as greater elimination of non-nitrogenous substances.

But the experiments of Fick and Wislicenus, made during an ascent of the Faulhorn, led them to deny altogether the increase of excretion of nitrogen, and to come to the conclusion that the energy generated in the muscles is the result of the burning (oxidation) of non-nitrogenous substances (fats and carbo-hydrates), and not of the burning of the albuminous constituents of muscular tissue; and they conclude that the nitrogenous constituents of muscles are rather to be regarded as forming the machine in which these substances are burned than as being themselves destroyed. (For a translation of their memoir, see *Phil. Mag.*, June, 1866, supplementary number).

Dr. Frankland (*Philosophical Magazine*, Sept., 1866) arrives at the conclusion that the non-nitrogenous constituents of the food, such as starch, fat, etc., are the chief sources of the actual energy, which becomes partially transformed into muscular work. He does not, however, deny to the albuminous matters a co-operation in the production of muscular power, but he regards their chief use as being to renew the muscular tissue. The muscles are thus the source both of animal heat and of muscular energy.

Dr. Parkes, in a long and careful series of experiments (see *Proceedings of the Royal Society*, vols. xv., page 339; xvi., page 44; xix., page 349; and xx., page 402), examined the effect of exercise, both with a non-nitrogenous and with a nitrogenous diet. He found no marked increase, but often a diminution, of the nitrogenous substances excreted during exercise, though subsequently a slight increase took place.

Dr. Pavy, in a series of elaborate experiments recorded in the *Lancet* (Feb., Mar., Nov., Dec., 1876; Jan., 1877), comes to a similar conclusion. He says: "The theoretical deduction to be drawn from the investigation which has been conducted is that, although the elimination of urinary nitrogen is increased by muscular exercise, yet the increase is nothing nearly sufficient to give countenance to the proposition that the source of the power manifested in muscular action is due to the oxidation of muscular tissue."

The theory of muscular action which Dr. Parkes proposes is as follows: During action the muscles appropriate nitrogen; this act is accompanied by changes in the carbo-hydrates, which lead to the manifestation of mechanical force; these changes lead to effete products (lactic acid, etc.) in the muscles, which, as appears from Ranke's experiments, stop their contraction. Then ensues an action of oxygen upon the nitrogenous framework of the muscle, and a removal of the effete products of the carbo-hydrates, so that the muscle becomes again capable of appropriating nitrogen, and of acting.

But, although some such theory as this finds favor with most physiologists, and agrees with most of the experiments on the subject, it is not universally accepted.

Dr. A. Flint of New York made observations on Weston, the American pedestrian, which seemed to show that, in his case at least, the excretion of nitrogen is very distinctly increased, both during and after severe muscular work. He accordingly comes to the conclusion that "the exercise of muscular power immediately involves the destruction of a certain amount of muscular substance, of which the nitrogen excreted is a measure." That is to say, he adheres to the original view of Liebig. His experiments are described in the *Journal of Anatomy and Physiology*, vol. xi., page 109; and his views are developed in the same journal, vol. xii., page 91, where also numerous references are given to other works and papers on the subject.

All observers are agreed that the amount of carbon excreted in the form of carbonic acid is very largely increased during exercise.

Besides the papers named above, the following may be consulted for a *résumé* of the subject: Liebig, in *Pharmaceutical Journal and Transactions*, 1870; Voit, in *Zeitschrift für Biologie*, 1870; Foster, *Text-Book of Physiology*, page 323.

MUSES, in the classic mythology, divinities originally included amongst the nymphs, but afterwards regarded as quite distinct from them. To them was ascribed the power of inspiring song, and poets and musicians were therefore regarded as their pupils and favorites. They were first honored among the Thracians, and as Pieria around Olympus was the original seat of that people, it came to be considered as the native country of the muses, who were therefore called *Pierides*. In the earliest period their number was three, though Homer sometimes speaks of a single muse, and once, at least, alludes to nine. This last is the number given by Hesiod in his *Theogony*, who also mentions their names—Clio (q.v.), Euterpe (q.v.), Thaleia (q.v.), Melpomene (q.v.), Terpsichore (q.v.), Erato, Polyhymnia (q.v.), Urania (q.v.), and Calliope (q.v.). Their origin is differently given, but the most widely spread account represented them as the daughters of Zeus and Mnemosyne. Homer speaks of them as the goddesses of song, and as dwelling on the summit of Olympus. They are also often represented as the companions of Apollo, and as singing while he played upon the lyre at the banquets of the immortals. Various legends ascribed to them victories in musical competitions, particularly over the sirens (q.v.). In the later classic times, particular provinces were assigned to them in connection with different departments of literature, science, and the fine arts; but the invocations addressed to them appear to have been, as in the case of modern writers, merely formal imitations of the early poets. Their worship among the Romans was a mere imitation of the Greeks, and never became truly national or popular. Among the places sacred to them were the wells of Aganippe and Hippocrene on Mount Helicon, and the Castalian spring on Mount Parnassus.

MUSE'UM (Gr. *mouseion*), originally the name given by the ancients to a temple of the Muses, and afterwards to a building devoted to science, learning, and the fine arts. The first museum of this kind was the celebrated Alexandrian museum (see ACADEMY). After the revival of learning in Europe, the term museum was sometimes applied to the apartment in which any kind of philosophical apparatus was kept and used; but it has long been almost exclusively appropriated to collections of the monuments of antiquity and of other things interesting to the scholar and man of science. In this sense it began to be first used in Italy, and probably in the case of the famous Florentine museum, founded by Cosmo de Medici, which soon became a great and most valuable collection of antiquities. Nothing analogous to the museums of modern times existed amongst the ancients, the greatest collections of statues and paintings which were made in the houses of wealthy Romans having been intended for splendor rather than for the promotion of art. The name soon ceased to be limited to collections of antiquities, and sculptures, and paintings; collections illustrative of natural history and other sciences now form a chief part of the treasures of many of the greatest museums, and there are museums devoted to particular branches of science. Of the museums of Britain, the British museum (q.v.) is the greatest; that of Oxford, founded in 1679, is the oldest.—The museum of the Vatican, in Rome, contains immense treasures in sculptures and paintings, and also in books and manuscripts.—The museum of the Louvre in Paris, that of St. Petersburg, and those of Dresden, Vienna, Munich, and Berlin, are amongst the greatest in the world. The usefulness of a museum depends not merely upon the amount of its treasures, but, perhaps, even in a greater degree upon their proper arrangement; and whilst great collections in the chief capitals of the world are of incalculable importance to science, its interests are also likely to be much promoted by those local museums, still unhappily not numerous, which are devoted to the illustration of all that belongs to particular and limited districts. Museums appropriated to the illustration of the industrial arts—their raw material, their machines, and their products—and of everything economically valuable, are of recent origin, but their importance is unquestionably very great. Preeminent among institutions of this kind in Britain are the South Kensington museum in London, and the Museum of science and art in Edinburgh.

MUSGRAVE, ANTHONY, b. Antigua, 1828; appointed secretary of Antigua, and afterwards administrator of Nevis. He was lieutenant governor of St. Vincent 1861–64, when he became governor of Newfoundland, where he remained till 1869, when he was appointed to the same position in British Columbia. He went out to Natal as lieutenant governor in 1871, was made governor of South Australia in 1873, and is now (1881) governor of Jamaica.

MUSGRAVE, GEORGE WASHINGTON, D.D., LL.D.; b. Philadelphia, 1804, of north-Irish and German descent, studied at the college of New Jersey and Princeton theological seminary, but was prevented by ill health from taking a degree; entered the ministry in 1828; was pastor of the Third Presbyterian church in Baltimore in 1830–52, and of the North Tenth street church in Philadelphia in 1862–68; was corresponding secretary of the Presbyterian board of publication in 1852–53, and of the board of home missions in 1853–61, and also in 1868–70. He has been a director of Princeton seminary since 1837, and a trustee of the college of New Jersey since 1859. He is an earnest Presbyterian, a rigid Calvinist, a leader in ecclesiastical affairs, and an able debater.

MUSH'ROOM, or AGARIC *Agaricus*, a genus of fungi, of the suborder *hymenomycetes*, having a *hymenium* of unequal plates or gills on the lower side of the *pileus*. The species are very numerous. Many of them are poisonous, many are edible, and some are among the most esteemed fungi. The species most esteemed in Britain is the COMMON MUSHROOM (*A campestris*), a native also of most of the temperate regions both of the northern and of the southern hemisphere, and of which a very large and fine variety occurs in eastern Australia. It is found during summer and autumn (but chiefly in autumn) in pastures, orchards, vineyards, etc. Its *pileus* is regularly convex, becoming almost flat when old; fleshy, dry, white with a tinge of yellow or brown; of a silky smoothness on the upper surface, or somewhat scaly, but never warty; thickly set on the under side with very unequal gills, which in a young state are pink, and afterwards become dark brown. The pileus is attached by its center to the top of the stem. The stem is of a firm fleshy texture, and *towards the top* is surrounded by a more or less distinct white membranous ring, the remains of the curtain or vail (*indusium*), which in a young state extends to the pileus, and covers the gills. This mushroom is gathered for the table when young, being preferred when the vail is still unbroken, and the unexpanded pileus has the form of a ball or button; but both in this state, and afterwards, whilst it shows no symptoms of decay, it is used for making ketchup (q.v.). It has a very pleasant smell and taste, and the flesh, when bruised, assumes a reddish-brown color.—Very similar to it, and often sold instead of it in London and elsewhere, but rejected by all skillful houskeepers as unfit even for making ketchup, is the St. George's Agaric (*A. Georgii*), sometimes called *whitecaps*, frequent in moist pastures and near buildings in all parts of Britain. This species is easily distinguished by its larger size—the pileus being sometimes 18 in. broad—its coarser appearance, its rather disagreeable smell, the yellow color which its flesh assumes when bruised, and the lighter color of its gills.—Care must be taken not to confound the common mushroom with the white variety of *agaricus phalloides*, a species not uncommon in Britain, chiefly in woods and on the borders of woods, which is very poisonous. Perhaps it is the possibility of this mistake which has led to the prohibition of the common mushroom in Rome, where many kinds of esculent fungi are brought in great abundance to the market, and where a special officer superintends the sale of them. *A. phalloides* is, however, easily distinguished by the ring at the *bottom* of the stem, the white color of the gills, the warts on the upper surface of the pileus, and the powerful smell, which becomes extremely disagreeable as the mushroom grows old.—Another species of mushroom much in use for the table is the Fairy-ring Mushroom (*A. oreades*), sometimes called *Scotch bonnets*—the *Champignon* of the French. It is common in pastures in Britain and most parts of Europe, often forming fairy rings (q.v.). It is much smaller than the common mushroom, the pileus being seldom more than an inch broad, the stem taller inproportion. The stem is solid, fibrous, and tough, with no ring; the pileus smooth, fleshy, tough, convex, with a more or less distinct boss (*umbo*) in the center, of a watery-brown color; the flesh white. The odor is strong, but agreeable. This mushroom is used for ketchup, and is also dried and powdered for use at table as a savory addition to sauces and stews. It is constantly brought to market in England. It is liable, however, to be confounded with several poisonous species; but only one of them, *A. dealbatus*, forms fairy rings, and this may be readily distinguished by its disagreeable odor, by its becoming grayish-brown in zones when soaked in water, by the margin of the pileus being at first rolled inwards, and by its very fine dingy whitish gills.—The other edible species of mushroom or agaric are numerous, but they are chiefly used on the continent of Europe, and scarcely at all in Britain, although some of them are common British plants.—The Orange-milked Agaric (*A. deliciosus*), which grows chiefly in fir-woods and among junipers, has a viscid pileus, 4 in. or more broad, at first orange, afterwards pale, the gills and juice orange, the gills running down the stem, the smell and taste agreeable.—The Mousseron (*A. prunulus*) is common in woods and pastures, particularly on sandy soils. It has a pileus about 2 to 4 in. broad, convex, yellowish-white when young, the gills at first white, and afterwards flesh-colored. The odor is agreeable. It is much esteemed on the continent as an article of food.—The Parasol Agaric (*A. procerus*) is found in pastures, especially under trees. It loves sandy soils. It is remarkable for its long stem, 8 to 12 in. high, with a thick spongy ring. The pileus is 3 to 7 in. broad, at first obtusely conic, then bell-shaped, covered with brown scales. The taste and smell are pleasant.—The White Field Agaric (*A. virgineus*) is one of the most common of British species, growing in pastures, with viscid or satiny white or whitish convex pileus, fully an inch broad, stem nearly 2 in. long, and light chocolate-colored distant gills, which run down the stem. It grows either singly or in groups.—The Anise Mushroom, or Sweet-scented Agaric (*A. odorus*), grows in shady woods and dells among moss and decaying leaves. It has a slightly convex pileus, about 3 in. broad, with pale gills. The odor is like that of anise.—The Ivory Mushroom (*A. eburneus*) is found in woods, with pileus 2 to 3 in. broad, of a grayish-yellowcolor, broad gills, and a rather long and somewhat scaly stem.—The Smoky Mushroom (*A. fumosus*), with pileus smoke-gray above, the gills and stalk yellowish, is common in fir-woods.—All these are edible, and more or less pleasant and nutritious. Finer than most of them is the Imperial Mushroom (*A. cæsarius*), the *Kaiserling* of the Germans, a species found in loamy soils in some parts of Europe, with orange pileus and lighter yellow stem and gills; but, unhappily, it is apt to be confounded with the very poisonous *amanita* (q.v.) *muscaria*.

The common mushroom is frequently cultivated both in the open garden and in houses or sheds. To grow it in the open garden, beds are prepared, generally of earth mixed with horse-dung, partly fresh and partly from old hotbeds, and are raised into ridges almost as high as broad. To grow it in houses, boxes are filled with alternate layers of half-rotten horse-dung and of straw, with a surface layer of fine mold. But of each of these methods there are many different modifications, none of which can here be detailed. In both, the production of mushrooms is sometimes left to the chance—often almost a certainty—of spawn (*mycelium*) or spores existing in the dung or earth; sometimes, to increase the probability of a speedy and abundant crop, earth is introduced into the bed or box from a pasture known to be rich in mushrooms, and mushroom spawn is also frequently planted, which is either collected where mushrooms grow, or produced by artificial means, often appearing and being propagated extensively without the development of the mushroom itself. The almost certain production of mushroom spawn in heaps of slightly fermenting horse-dung, straw, and earth, has been often urged as an argument in favor of the equivocal generation of fungi, but the minuteness and multitude of the spores may more reasonably be urged on the opposite side.

MUSIC (Gr, *mousike*, from *mousa*, muse: Lat. *musica*), a combination or succession of sounds having the property of *pitch*, so arranged as to please the ear. The pleasure derived from music arises from its exciting agreeable sensations, and raising pleasing mental images and emotions. Apart from words, it expresses passion and sentiment, and linked to words, it loses its vagueness, and becomes a beautiful illustration of language.

The doctrine of musical sounds is based on the principles of acoustics (q.v.). Sound is conveyed through elastic media by waves, not of alternate elevation and depression, but of alternate condensation and rarefaction; in which it is the form, the condition of the groups of particles that progresses, not each individual particle. When a series of vibrations recur on the ear at precisely equal intervals of time, following each other so closely that each cannot be separately distinguished, the result is a musical sound or note. The sound ceases to have a musical character when each pulsation is individually audible, as is the case when there are fewer than about sixteen beats in a second. The gravity or sharpness of the sound is called its pitch, and depends on the number of vibrations in a given time. A succession or progression of musical sounds following each other constitutes melody; the difference in pitch between any two of them is called an interval. Where two or more musical sounds, whose relative pitch is properly proportioned, are heard simultaneously, the result is a chord, and a succession of chords constitutes harmony.

When a vibration is communicated to a string stretched between two points, the result is a musical note, whose pitch is dependent on the length of the string and the degree of tension applied to it: the shorter the string, and the greater the tension, the higher is the pitch. If the string be devided in the middle, the tension remaining the same, the note produced is twice as high in pitch, and is called the octave to the note produced by the whole string. Every vibration of the one corresponds to two of the other, and there is between a note and its octave a far closer relation than between any two other notes; they go together almost as one sound, and are considered to a great extent as one musical sound. In the diatonic scale, familiar to every correct ear, there are six notes, bearing certain harmonic relations to the fundamental note, interposed between it and its octave; and as we ascend, the notes arrange themselves in similar successions of sevens, each set an octave higher, or double the pitch of that which preceded it. The seven notes are designated by the names of the first seven letters of the alaphabet, the same letter being used for any note and its octave. For another notation also in use, see SOLMIZATION. Taking C for the fundamental note, we have for our scale.

$\dot{C}$ D E F G A B $\dot{C}$ D E F G A B $\dot{C}$, etc.

The scale may be extended up or down indefinitely, so long as the sounds obtained continue to be musical. The satisfaction and sense of completeness which the diatonic scale gives the ear, arise from its being founded on correct harmonic principles. The quality called harmony is produced by a coincidence of vibrations; notes are more harmonious the oftener their waves coincide. Besides the octave, two of whose waves coincide with one of the fundamental, there are other intervals harmonious, though in a less degree. Dividing our string into three parts instead of two, we have a note higher than the octave, which may be lowered by an octave by making the string two-thirds of the original length, and produces a wave of which three coincide with two of the fundamental. Next to the octave, this note stands in the most intimate relation to the fundamental; it is called the dominant. Dividing the string by five, and lowering the note two octaves, another harmonic is got, called the mediant. In contradistinction from both these, the fundamental note (or any of its octaves) is called the tonic or key-note. C being taken as the key-note, E is the mediant, and G the dominant. These three notes, when struck simultaneously, form the harmonic triad, and stand to each other in the relation of 1, $\frac{5}{4}$, $\frac{3}{2}$, (numbers indicating the number of vibrations, which are inversely as the length of the string), or, reducing fractions to integers, in the relation of 4, 5, 6. When a musical string is vibrating, these sounds are heard on close observation more or less distinctly vibrating along with it, the cause being a spontaneous division of the string into aliquot parts, producing subordinate vibrations simultaneously with the principal vibrations. But the dominant may in its turn be the tonic from which another triad of tonic, mediant, and dominant is taken, forming a scale of triads extending indefinitely up and down, and it is from three such adjacent triads that the diatonic scale originates. Its elements are the triad of the tonic united with the triads which stand in the most intimate relation to it—viz., those immediately above and below it—

FAC, CEG, GBD.

F is the note whose dominant is C (the tonic), and therefore, in respect of C, it is called the subdominant. A is the mediant of the subdominant F, and therefore called the submediant. D is the dominant of the dominant, and is called the super-tonic. B, the mediant of the dominant is called the leading note. We have seen that the notes of each triad stand to each other in the relation of 4, 5, 6. Preserving this proportion, and multiplying to avoid fractions, we have

F A C E G B D
as 16, 20, 24, 30, 36, 45, 54

We must multiply F and A by 2, and divide D by 2, to bring them within the compass of an octave, and then we have

C D E F G A B C
as 24, 27, 30, 32, 36, 40, 45, 48

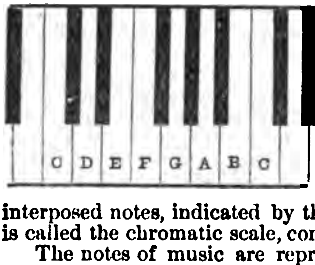
These are the degrees of the diatonic scale, which are indicated by the white keys of the pianoforte, as in the figure represented below.

The interval CD is commonly called a second; CE, a third; CF, a fourth; CG, a fifth; CA, a sixth; and CB, a seventh; CC being, as already seen, an eighth or octave—names corresponding to the position of the notes on the key-board or in the diatonic scale, but having no relation to the proper proportional numbers already given. The intervals of the third, fifth, and sixth (counting from the key-note), owing to the more intimate harmonic relation of the notes between which they lie, afford more satisfaction to the ear than the others, or are, as it is called, the most perfectly consonant intervals. Intervals may be counted from any note as well as the tonic. DF is called a third as well as CE, although these intervals are unequal. We may have intervals beyond the octave; they are, however, substantially but repetitions of those below, CD, a ninth, being also a second, and so on.

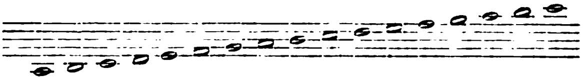
It is often desirable in the course of a musical composition to change the key-note, which involves the formation of a diatonic scale on some other note than C, in which case we are said to modulate from one key into another. As the intervals CD, DE, EF, etc., are by no means all equal, the notes which we have already got will not do for a scale founded on any other tonic than C. The ratios of the intervals in the diatonic scale, expressed in numbers by logarithms, are:

C D E F G A B C
51 46 28 51 46 51 28

At first sight it would appear that in keyed instruments there must be a separate row of keys for each tonic, but practically this is found not to be necessary. If D instead of C be taken as key-note, E, G, and A are some approach to the correct second, fourth, and fifth, but F and C are greatly too low in pitch for a proper third and seventh. With some notes taken as key-note, the correspondence is greater, with others it is less. The difficulty is overcome by a system of compromises called temperament (q.v.). Roughly speaking, we have in the diatonic scale an alternation of two long intervals, a short interval, three long intervals, and a short interval. The long intervals 51 and 46 are styled tones, and the short interval 28 a semitone. Were the tones all equal, and the semitone exactly half a tone, a note interposed in the middle of each tone, dividing the seven intervals into twelve, would make it immaterial where the scale began. A system founded on this supposition is the remedy actually adopted in most keyed instruments, and the inaccuracy produced by this compromise is not sufficiently great to offend the ear. The interposed notes, indicated by the black keys of the pianoforte (see fig.), complete what is called the chromatic scale, consisting of twelve intervals approximately equal.

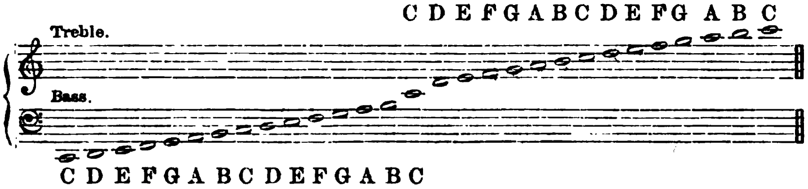


The notes of music are represented in ordinary notation on a series of five parallel lines, called the staff. On these lines, and in the four spaces between them, marks are placed indicating the notes, which are counted upwards, beginning with the lowest line. Every line or space is called a degree, the staff consisting of nine degrees.



When more than nine notes are required, the spaces below and above the staff are used, and the scale is extended by means of short added lines, called leger lines. The pitch of the notes on the scale is determined by a figure called a clef (*clavis*, a key).

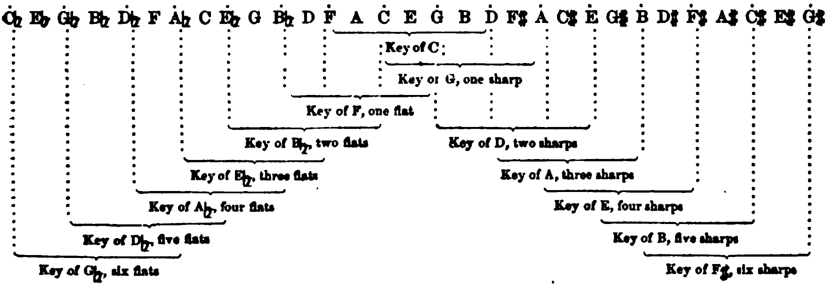
placed at the beginning of the staff on a particular note, from which all the others are counted. The clefs most in use are the bass, tenor, and treble clefs, represented on the notes F, C, and G respectively (see CLEF). The treble and bass clefs only are used in music for keyed instruments, and when a staff is required for each hand they are joined together by a brace, the upper staff for the right hand, the lower for the left. The ascending scale in these clefs is as follows:



These notes correspond with the white keys of the pianoforte or the diatonic scale when C is key-note, no allowance being made for the black keys, which, as we have seen, divide the tones into semitones. Those semitones which do not occur with C as key-note are represented by the signs ♯ (sharp) and ♭ (flat). The sign ♯, prefixed to a note, elevates it a semitone in the scale, raising, for example, F to F sharp. ♭ lowers the note by a semitone, depressing B to B flat. When a note which has been elevated by a sharp, or depressed by a flat, is to be restored to its original place, the character ♮ (natural) is prefixed to it.

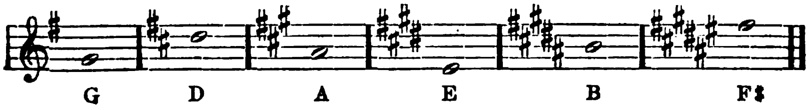
The names of the intervals correspond to the degrees of the staff, but it has been seen that intervals of the same name are not necessarily equal. If the sign of a flat or a sharp be prefixed to either note of an interval, it still preserves its name of a third, a fifth, etc.; but to distinguish intervals of the same degree, the qualifying epithets of major and minor, augmented and diminished, are used.

The different keys in music are best understood by reverting to the scale of triads, on which the diatonic scale is founded. Taking a series of triads, of which the dominant of each is the key-note of the next, we obtain the following scale, extended both upwards and downwards from C:

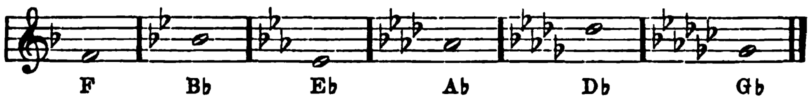


Each triad is composed of the key-note, its mediant, and dominant, and the scale of each key is composed of the triad of the key-note, with the triad immediately preceding and that immediately following it. Each key is succeeded by the key of its dominant, and if we begin with the key of C (in the middle of the scale), each key acquires an additional sharp until we reach the key of F♯ with six sharps. These are the sharp keys. If, beginning again with the key of C, we go back instead of forwards in the scale of triads, we obtain the flat keys; each key has an additional flat to that above it, till we come down to the key of G♭ with six flats. This key in instruments with temperament is exactly the same with that of F♯, and on this account it is not generally found convenient to extend the keys beyond six, or at most seven, sharps or flats. C♯ with seven sharps is the same as D♭ with five flats, and C♭ with seven flats is the same as B with five sharps. In music written in these keys, double sharps and double flats occur, which are indicated by the characters × and ♭♭ respectively. In writing music in any key with sharps or flats, it is usual, instead of prefixing the sharp or flat to each note when required, to place the sharps and flats belonging to the key together after the clef, on the degree to which they belong, and such collections of sharps or flats are called the signature.

SIGNATURES OF THE SHARP KEYS.



SIGNATURES OF THE FLAT KEYS.



A sharp or flat introduced in a composition which does not appear in the signature, is prefixed to the note, and called an accidental.

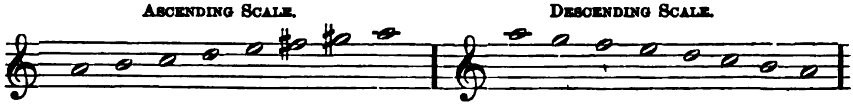
The diatonic scale and keys above described belong to what is called the major mode; there is also another mode in use called the minor mode. In the minor, as in the major mode, the diatonic scale and the keys are based on the scale of triads. Each of the triads already considered consists of two unequal intervals, called a major third and minor third. Supposing we begin with the minor instead of the major third, we have a succession of chords taking their minor third from one triad and their major third from another. These compound chords are called minor triads. Their proportion is as 10, 12, 15, and out of three such consecutive minor triads the scale of the minor mode is constructed.

Ḋ F Ȧ C Ė G Ḃ
80, 96, 120, 144, 180, 216, 270

Multiplying D and F by 2, and dividing B by 2, to bring the whole within the compass of an octave, we have:

A B C D E F G A
120, 135, 144, 160, 180, 192, 216, 240.

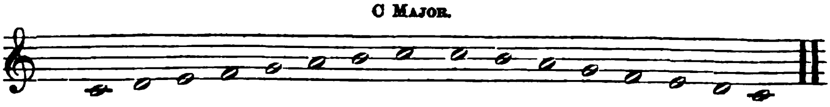
The scale here represented is what is known as the descending scale of the minor mode. When the seventh of the scale ascends to the eighth, it becomes sharp, as the proper leading note or sharp seventh to the tonic. This sharp is, however, always omitted from the signature, and placed accidentally before the seventh which it is to elevate. In order to avoid the harsh interval of the augmented second (from F to G♯), it is usual in the ascending scale to make the sixth sharp also, in order to accommodate the seventh; thus the ascending or accidental scale of the minor mode has two notes altered from the signature.

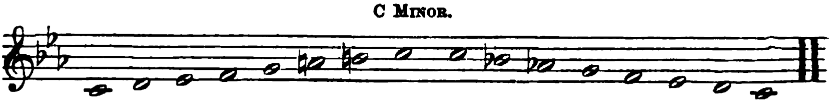

ASCENDING SCALE. DESCENDING SCALE.

Each minor scale is called the relative minor to the major scale on its right hand in the scale of triads, with which it has the same signature: thus the relative minor scale to C major is that of A minor.

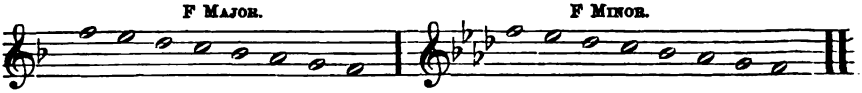
C major Ḟ A Ċ E Ġ B Ḋ
A minor Ḋ F Ȧ C Ė G Ḃ

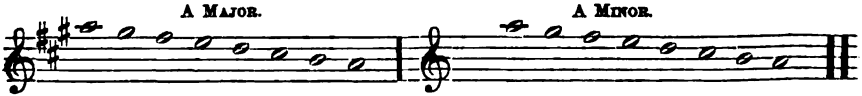
Each minor scale is also called the tonic minor to the major scale on the same key-note, from which it differs in flattening the third of its tonic, and in the descending scale also the third of its subdominant and dominant. The tonic minor scale to C major is C minor.

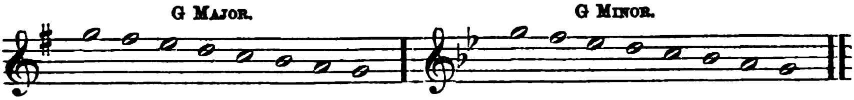

C MAJOR.


C MINOR.

As the descending scale regulates the signature, each tonic minor has three flats more or three sharps less in its signature than its tonic major.

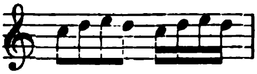

F MAJOR. F MINOR.


A MAJOR. A MINOR.


G Major. G Minor.

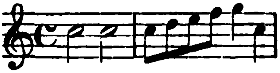
In this last example, F♯, B♮, and E♮ are all considered sharps in contrast with F♮, B♭, and E♭ of the minor scale.

Rhythm.—In musical notation the relative duration of notes is indicated by their form. Notes may be open or close; they may consist of a head only, or of a head and stem. Where there is a stem, it may be turned up or down, according to convenience. The semibreve, the longest note in ordinary music, is open, and consists of a head only (𝅝). The minim is an open note with a stem, half the length of a semibreve 𝅗𝅥; the crotchet is a close note with a stem, half the length of a minim 𝅘𝅥; the quaver is a close note with a stem and hook, half the length of a crotchet 𝅘𝅥𝅮; a quaver is further divided into two semiquavers with two hooks 𝅘𝅥𝅯; four demi-semiquavers with three hooks 𝅘𝅥𝅰; and eight semi-demi-semiquavers with four hooks 𝅘𝅥𝅱. In slow religious music, an open square note, called a breve 𝅜, sometimes occurs. The semibreve is equivalent in time to two minims, four crotchets, eight quavers, sixteen semiquavers, thirty-two demi-semiquavers, and sixty-four semi-demi-semiquavers. The notes formed with hooks may be grouped together

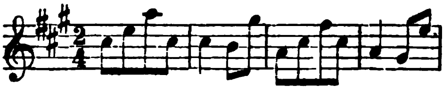


. In vocal music this is not done except when a group is to be sung to one syllable. When a dot is placed after a note 𝅗𝅥. it is lengthened by one-half; when two dots, 𝅗𝅥.. it is lengthened by three-fourths.

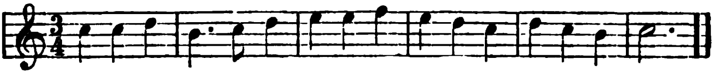
Every piece of music is divided into portions equal in time, called measures, which are separated from each other by vertical lines called bars. The term bar is often loosely used to denote the measure as well as the line. The exact length of the measure is indicated by a sign at the beginning of the movement. In common time, indicated by the sign 𝄴 each measure includes a semibreve, or its equivalent made up in notes of lower value:



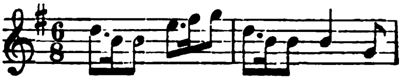
All other measures of time have for their signatures two figures placed as a fraction, one over the other. The figures of the denominator are either 2, 4, 8, or 16, which stand for minims, crotchets, quavers, and semiquavers respectively (i.e., halves, fourths, etc., of a semibreve); the numerator indicates the number of these fractional parts of a semibreve contained in each measure. There is another form of common time besides that already noticed, which is called half-time, has a minim or two crotchets in the measure, and is known by the signature $\frac{2}{4}$ i.e., two crotchets—



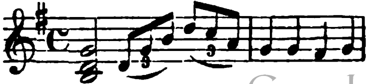
When there are three minims, crotchets, or quavers in a measure, the piece is said to be in triple time, its signature being $\frac{3}{2}$, $\frac{3}{4}$ or $\frac{3}{8}$.



When two or four measures of triple time are united in one measure, the movement is said to be in compound common time. Its usual forms are indicated by the signatures $\frac{6}{4}$ and $\frac{6}{8}$ In the first, there are three submeasures of three crotchets; in the second, two submeasures of three quavers

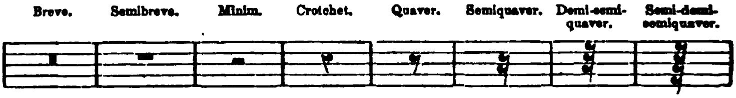


Compound triple time occurs where there are nine notes in a measure, either crotchets, quavers, or semiquavers, grouped in threes. Its signatures are $\frac{9}{4}$, $\frac{9}{8}$ and $\frac{9}{16}$ A variety occasionally occurs in simple or triple time by the measure note being divided into three, or even five or seven, instead of two parts, which are grouped together, sometimes with the figure 3, 5, or 7, placed above them.

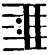


The object of the division of musical passages into measures is to indicate their rhythm, a quality forming an essential element in the pleasure derived from music. Notes of music, like words or syllables, are accented or unaccented. The principal accent is given to the first note of a measure. Of the four measure notes in common time, the third has also a subordinate accent, as has the third measure note in triple time. There are occasions when a strong accent, or emphasis as it is called, is laid on the part of the measure which is usually unaccented; this the composer indicates by the Italian terms *rinforzando*, *sforzato*, abbreviated *rinf.*, *sf.*

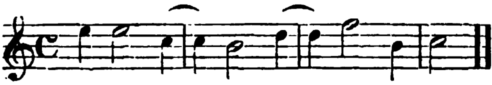
When in the course of a movement silence is required for a time, this is indicated by a rest or rests corresponding to that time; the breve, semibreve, minim, etc., have each their respective rests, which are represented as follows:



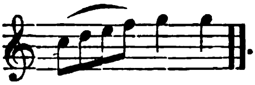
A rest may, like a note, be dotted to indicate the addition of half to its length.

The double bar  consists of two strong vertical lines, placed at the end of a musical composition, and also at other parts (not necessarily coincident with the end of a measure) where a strain or rhetorical division of a movement terminates. When dotted on one side, all the measures on the side with the dots are to be repeated from the beginning, or from the antecedent double bar.

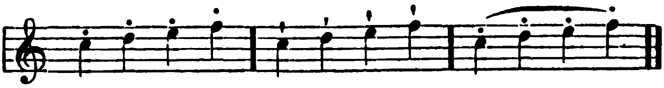
A tie is an arch placed between two notes on the same degree, to indicate that instead of the two notes written, one note is to be played of the length of both. When the last note of one measure is thus connected with the first of the next measure, the former, though naturally the unaccented note, acquires the emphasis—



When the same arch is drawn over two or more notes not in the same degree, it is called a slur, and merely indicates that they are to be played smoothly or fluently (*legato*)

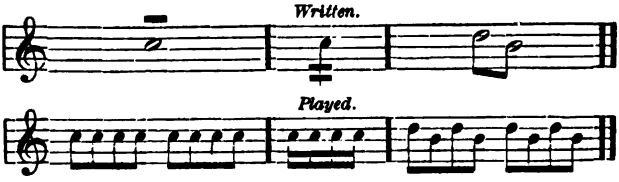


When notes are to be played short, distinct, and detached (*staccato*), a dot is placed over them. A dash implies a greater, and the union of dot and slur a less degree of staccato—

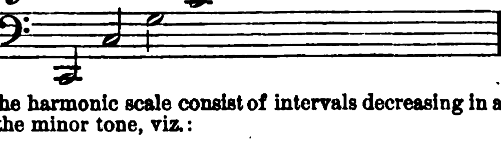


The pause 𝄐 placed over a note indicates a delay in the time of the movement, and a continuance of the sound made on that part of the measure.

The various degrees of softness and loudness which occur in a piece of music are indicated by the letter *f* for *forte*, loud; *p* for *piano*, soft, also *pp* for *pianissimo*, very soft; *mf* for *mezzo forte*, rather loud, and *ff* for *fortissimo*, very loud. A gradual increase of loudness is denoted by the word *crescendo*, or the sign <; and a diminution from loud to soft by the word *diminuendo*, or the contrary sign >. Many other expressions are used in the body of written music, indicating slowness, quickness, and the character of execution. The most important of them are explained under separate articles—as are the various musical graces or embellishments known under the names of the appoggiatura, beat, shake, and turn. Among abbreviations in frequent use are a line drawn over or under a semibreve, or through the stem of a minim or crotchet, to divide it into quavers; or a double line, to divide it into semiquavers. Two minims may be connected to indicate their repetition as quavers. Thus—



Harmony.—We have mentioned that when a string is struck, its harmonics are more or less distinctly heard along with it. This arises from the string spontaneously dividing itself into aliquot parts—as one-half, one-third, one-fourth, one-fifth, one-sixth, one-seventh, etc., of the string. The numbers 2, 3, 4, 5, 6, 7, expressing the relative number of vibrations in a given time, are a measure of the pitch of the note, and placed proportionally to one another, or in the form of a fraction, they are a measure of the interval. The prime numbers 2, 3, 5, and 7, and their compounds, constitute the harmonics of a musical sound: no division by a higher prime number is tolerable to the ear along with the fundamental note, and no sound corresponding to such division is audible in the vibrations of a string—

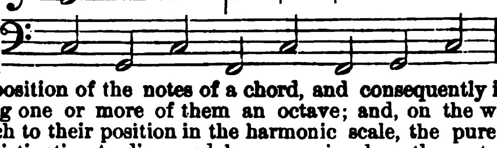


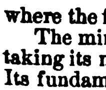
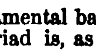
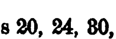
The degrees of the harmonic scale consist of intervals decreasing in a geometrical ratio from the octave to the minor tone, viz.:

1 : 2 Octave.
2 : 3 Fifth.
3 : 4 Fourth.
4 : 5 Major third.
5 : 6 Minor third.
6 : 7 Grave third.
7 : 8 Tone maximus.
8 : 9 Tone major.
9 : 10 Tone minor.

Other intervals more or less consonant are to be found in the harmonic scale, of which the most important is 4 : 7, the grave seventh. From this scale is derived the triad, which we have seen to be the foundation of the diatonic scale, and also the whole theory of chords.

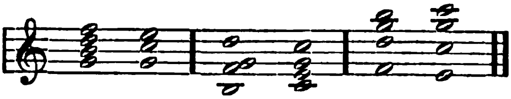
The first five notes of the harmonic scale are the component parts of the major common chord, by far the most consonant chord that can be produced by five notes. Neglecting octaves, its essential notes are the major triad, C E G, or 4, 5, 6, which, as already seen, consists of a fifth divided harmonically into major third and minor third. The root on which a chord is formed, or the note by whose division into aliquot parts the notes of the chord are produced, is called its fundamental bass, and the fundamental bass of the triad C E G is C. The common chord is the triad with the addition of the octave of the root; its proportions are 4, 5, 6, 8. Every key contains within itself two other triads besides that of the key-note—viz., those of the subdominant and dominant, which have the subdominant and dominant of the key-note respectively for their fundamental bases; and the feeling of satisfaction produced by the diatonic scale arises out of the fact that its notes belong to a progression of chords formed on a fundamental bass suggested by the ear. This fundamental bass is here indicated on the lower staff—

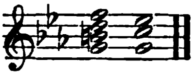


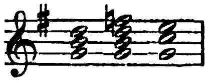
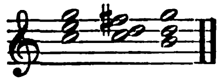
The relative position of the notes of a chord, and consequently its intervals, may be altered by raising one or more of them an octave; and, on the whole, the nearer the intervals approach to their position in the harmonic scale, the purer is their harmony. Close, in contradistinction to dispersed harmony, is when the notes of a chord are so near that no component note could be placed between them. When the fundamental bass of a chord ceases to be its lowest note, the chord is said to be inverted. Thus  and  are inversions of the common chord, but not , where the fundamental bass is still the lowest note.

The minor triad is, as we have seen, a compound chord, whose ratio is 20, 24, 30, taking its minor third from the triad below, and its major third from the triad above. Its fundamental bass is the key-note. The minor mode has, like the major, three triads in each key—those of the tonic, subdominant, and dominant; and the minor common chord admits of the same inversions as the major, by making the third or fifth the lowest note.

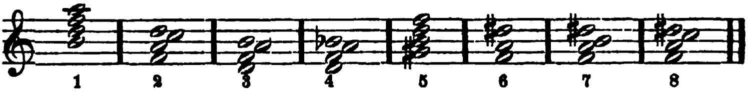
The first seven notes of the harmonic scale contain the chord next in consonance to the common chord, the chord of the seventh or dominant harmony. Rejecting octaves, it is the harmonic triad with the addition of the grave seventh, 4, 5, 6, 7, C E G B♭, or G B D F, and admits of three inversions, according as the third, fifth, or seventh is taken instead of the root as the lowest note. This chord belongs to the key of which its fundamental note is the dominant; and in order to satisfy the ear, it requires to be followed by a resolution into the common chord of the key, or one of its inversions, the major third rising a semitone to the key-note, and the seventh descending one degree—



The dominant seventh note is flatter by an interval of 63, 64, than the subdominant of the key, though the two are not distinguishable on keyed instruments. The chord of the dominant seventh is the same in the tonic minor as in the major mode, but differs in its resolution, in respect that it descends a tone instead of a semitone 

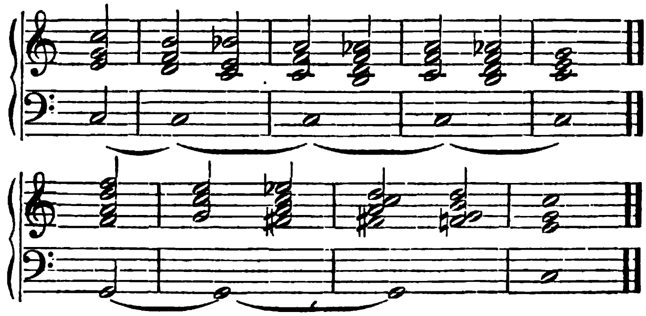
The dominant harmony affords numerous means of modulating from one key to another. For example, the addition of a dominant seventh to the common chord of a key, effects a modulation into the key of the subdominant  In modulating into the key of the dominant, the supertonic bears the dominant harmony, and becomes dominant of the new key  For other modulations, we must refer to works on the theory of music.

The following more complex harmonies are also in general use—



1, the chord of the added ninth, consisting of the dominant harmony (its root generally omitted) with the fifth of the adjacent triad above; 2, 3, and 4, the different forms of the added sixth, or chord of the subdominant; 2 is the triad of the subdominant, with the third of the adjacent triad below, or rather its octave; 3 is the triad of the subdominant, minor mode, with the third of the adjacent triad below; and 4, the same triad with the third of the tonic major to the adjacent triad below; 5, the diminished seventh, a compound of the characteristic notes (B F) of the dominant harmony of the major mode with those (G♯ D) of the relative minor; 6, 7, and 8, the augmented sixths, all dominant harmonies, resolving into the major tonic; 6, called the Italian sixth (F A D♯), is a compound of the characteristic notes (A D♯) of the dominant harmony of the minor mode (B D♯ F A) inverted, with the dominant seventh note (F) of the major triad (C E G) below for a bass; 7, the French sixth (F A B D♯), the same as the last, with the addition of the octave to the fundamental bass; 8, the German sixth (F A C D♯), compounded of the characteristic notes of the dominant harmony of the minor mode inverted, with the dominant sevenths of the major triads below and above.

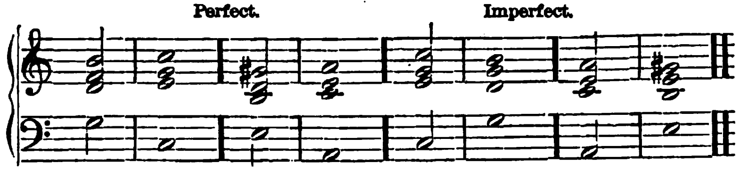
All classical harmonies can be reduced to the chords enumerated, varied by inversions, omissions, suspensions, and pedal basses. A pedal bass or organ point is a bass note sustained through a progression of chords, to only the first and last of which it is the proper bass. The pedal bass of the tonic is often used with the chord of the dominant seventh, the added ninth, and the diminished seventh, and occasionally with other chords: sometimes the pedal harmonies are taken on the dominant instead of the tonic, and the holding note sometimes occupies an upper part instead of the bass—



A musical composition consists of a succession of notes or of chords subject to certain laws. Like discourse, music has its phrases, periods, and punctuation. When a piece of music continues in the same key, it is said to move by progression, a term used in contradistinction to modulation, where the key is changed. Progression in music of two parts is of three kinds—oblique, when one part repeats or holds on the same note, while the other moves up and down; direct, where both parts move in the same way; and contrary, where one moves up, and the other down. Consecutive chords should in general be connected, either as having some note in common, or as being the chords of closely connected keys. There are certain chords which require a special resolution—i.e., they must be followed by certain other chords; and there are certain progressions which, from harshness, are in ordinary cases to be avoided, more particularly consecutive fifths and consecutive octaves, the latter, however, being admissible when used merely to strengthen a part. Modulation is generally effected by introducing the chords common to both keys, and the secret of good modulation consists in the skillful choice of intermediate chords. Every regular piece of music is composed in a particular key, in which it begins and ends, and which predominates over all the other keys into which it has modulated. The keys into which a key most readily modulates are those most nearly related to it—viz., the dominant, the subdominant, and the relative and tonic major or minor. We have seen how modulation may take place by introducing the dominant harmony of the new key or one of its inversions, and in this way the entire harmonic circle of the keys can be made, either by ascending or descending fifths; but in order to effect this change, it will be necessary, on reaching the key of C♯ with seven sharps, to substitute, by what is called an enharmonic (q.v.) change, D♭ with five flats, or *vice versâ*, which on instruments with temperament produces no real change on the pitch, but merely on the names of the notes.

The arrangement of chords which the ear naturally expects at the close of a strain is called a cadence; it corresponds in music to the period which closes a sentence in discourse. It is perfect when the harmony of the dominant precedes the harmony of the key-note, and imperfect when the harmony of the key-note precedes that of the dominant without its seventh.

The imperfect cadence is the most usual termination of a musical phrase, or short succession of measures containing no perfect musical idea. A portion of melody formed of two regular phrases, and containing a perfect musical idea, is called a section, and its regular termination is the perfect cadence.



Music is produced by the human voice, and by a variety of artificial instruments. For the application of the voice to musical purposes, see SINGING. Musical instruments are classified as stringed instruments, wind instruments, and instruments of percussion. In some stringed instruments as the pianoforte, the sounds are produced by striking the strings by keys; in others, as the harp and guitar, by drawing them from the position of rest. In a third class, including the violin, viola, violoncello, and double bass, the strings are put into vibration with a bow. In wind instruments the sound is produced by the agitation of an inclosed column of air; some, as the flute, clarionet, oboe, bassoon, flageolet, instruments of wood, and the trumpet, horn, cornet-a-piston, etc., of metal, are played by the breath; in others, as the organ, harmonium, and concertina, the wind is produced by other means. In the two last-named instruments, the sound is produced by the action of wind on free vibrating springs or reeds. Instruments of percussion are such as the drum, kettle-drum, cymbals, etc. The chief peculiarities of the more important musical instruments are noticed in special articles.

Musical compositions are either for the voice, with or without instrumental accompaniment, or for instruments only. Of vocal music, the principal forms may be classed as church music, chamber music, dramatic music, and popular or national music. The first includes plain song, faux-bourdon, the chorale, the anthem, the sacred cantata, the mass and requiem of the Roman Catholic church, and the oratorio. Vocal chamber music includes cantatas, madrigals, and their modern successors, glees, as also recitatives, arias, duets, trios, quartets, choruses, and generally all forms, accompanied or unaccompanied, which are chiefly intended for small circles. Dramatic music comprehends music united with scenic representation in a variety of ways, in the ballet, the melodrama, the vaudeville, and the opera, in which last, music supplies the place of spoken dialogue. Instrumental music may be composed for one or for more instruments. The rondo, the concerto, the sonata, and the fantasia generally belong to the former class; to the latter, symphonies and overtures for an orchestra, and instrumental chamber music, including duets, trios, quartets, and other compositions for several instruments, where each takes the lead in turn, the other parts being accompaniments. These and other forms of composition will be found noticed separately.

History of Music.—A certain sort of music seems to have existed in all countries and at all times. Even instrumental music is of a very early date: representations of musical instruments occur on the Egyptian obelisks and tombs. The music of the Hebrews is supposed to have had a defined rhythm and melody. The Greeks numbered music among the sciences, and studied the mathematical proportions of sounds. Their music, however, was but poetry sung, a sort of musical recitation or intoning, in which the melodic part was a mere accessory. The Romans borrowed their music from the Etruscans and Greeks, and had both stringed instruments and wind instruments.

The music of modern Europe is a new art, with which nothing analogous seems to have existed among the nations of antiquity. The early music of the Christian church was probably in part of Greek, and in part of Hebrew origin. The chorale was at first sung in octaves and unisons. St. Ambrose and Gregory the great directed their attention to its improvement, and under them some sort of harmony or counterpoint seems to have found its way into the service of the church. Further advances were made by Guido of Arezzo, to whom notation by lines and spaces is due, but the ecclesiastical music had still an uncertain tonality and an uncertain rhythm. Franco of Cologne, in the 13th c., first indicated the duration of notes by diversity of form. The invention of the organ, and its use in accompanying the chorale, had a large share in the development of harmony. Along with the music of the church, and independently of it, a secular music was making gradual advances, guided more by the ear than by science; it seems to have had a more decided rhythm, though not indicated as yet by bars. The airs which have become national in different countries were developments of it, but it had its chief seat in Belgic Gaul; and the reconciliation of musical science with musical art begun in Flanders by Josquin Duprès in the 15th c., was completed in the 17th c. by Palestrina and his school at Rome, and reacted eventually on the ecclesiastical style. The opera, which appeared nearly contemporaneously with the Reformation and revival of letters, greatly enlarged the domain of music. Italy advanced in melody, and Germany in harmony. Instrumental music occupied a more and more prominent place. Corelli's compositions exalted the violin. Lulli and Rameau, with their ballet-like music, seized the characteristics of French taste, till the German Glück drove them out of the field. The scientific and majestic fugue reached its highest perfection under J. S. Bach. The changes introduced in ecclesiastical music in England at the restoration gave birth to the school of Purcell; and a little later England adopted the German Handel, who was the precursor of Haydn, Mozart, Beethoven, Spohr, and Mendelssohn. The principal fact in recent musical history is the movement with which the name of Wagner is connected, having for its aim the production and perfection of a true musical drama, in which, unlike the opera, the words and music shall be of equal importance.

See Pepusch's *Treatise on Harmony*, Calcott's *Musical Grammar*, Hawkins's and Burney's *History of Music*, Marx's *Allgemeine Schule de Musik*, Brown's *Elements of Musical Science*, and Chambers's *Information for the People*, Nos. 96–97 (1875).

MUSIC (*ante*). The history of music in the United States had its origin in the quaint and primitive psalm-singing of the Puritans, and until 1825, when Italian opera was first given in this country, church music was cultivated to the exclusion of all other styles. It appears that Ainsworth's version of the Psalms was brought over by the Pilgrim Fathers who landed on Plymouth rock; and remained in use till 1693, when the *Bay Psalm-Book* was generally adopted. This latter version was printed in 1640 in Cambridge, Mass., with the title *The New England Version of the Bay Psalm-Book*, and was the first important publication of its kind in America. Although it had been compiled by an association of New England ministers, and approved by the churches, it met with great opposition, as many congregations looked upon the old version as a legacy intrusted to them by their forefathers. Among other scruples of conscience were, whether the singing of the Psalms of David with a lively voice was proper in these New Testament days. This and other quibbles set the churches into a turmoil, which did not subside until the rev. John Cotton wrote a tract in answer to the objections, which was sent to all the churches. Nathaniel D. Gould states in his book on *Church Music in America* that "when this tract or circular was read, and their feelings were reconciled, other objections and queries arose, namely, whether it was proper for one to sing, and all the rest to join only in spirit, and saying amen, or for the whole congregation to sing. Whether women as well as men, or men alone, should sing; whether pagans (the unconverted), be permitted to sing with us, or church-members alone. Also, whether it be lawful to sing psalms in meter devised by man, and whether it be lawful to read the psalm to be sung, and whether proper to learn new tunes which were uninspired; for it appears that they had so long been accustomed to hear and sing the same few tunes that they had imbibed the idea that the tunes were inspired, and that *man's* melody was only a vain show of art." Previous to the year 1690 there were but eight or ten psalm-tunes, taken mostly from Ravenscroft's collection, and they were sung in rotation, without any regard to the subject of the preacher. About 1712 rev. John Tufts of Newbury published a book of twenty-eight tunes, with rules "that the tunes might be learned with the greatest ease and speed imaginable." When it was made known that some had acquired the art of learning a tune by note, without having heard it sung, "all were amazed, and still more astonished that all could finish a tune together." Rev. Thomas Walter of Roxbury, Mass., in 1721, edited the first book of music (except the few tunes attached to the *Bay Psalm-Book*), with the art of singing by note, with bars to divide the notes or measures, for the first time. The rev. Mr. Barnard of Marblehead published the psalms and hymns in verse, with fifty tunes at the end of the book. His work contained such tunes as Mear, Windsor, etc., in three parts, with one page of instructions. James Lyon of Philadelphia, in 1761, published a choice collection of psalm-tunes, hymns, and anthems, in two, three, and four parts, called *Urania.* Josiah Flagg of Boston, in 1764, published a collection of church-music, engraved by Paul Revere, containing 116 tunes, generally of rather a light character. In 1770, appeared in Boston, *The New England Psalm-Singer, or American Chorister, containing a number of psalm-tunes, anthems, and canons, composed by William Billings, a native of New England.* This book opened a new era in American church music. William Billings was the author of six books of music, which were nearly all original, and very popular in their day. He was a zealous patriot, and the words to which he set many tunes combined religion and patriotism. These melodies were sung in the tent by the soldiers as well as in the church, and did much toward exciting the spirit of liberty among the people. Among those who succeeded Billings in compiling and composing church-music were Andrew Law, Oliver Holden, Samuel Holyoke, Daniel Reed, William Little, Timothy Swan, George Lucas, Thomas Hastings, Lowell Mason, George James Webb, N. Gould, Henry E. Moore, William B. Bradbury, E. Ives, B. F. Baker, H. W. Greatorex, George Kingsley, L. O. Emerson, Charles Zeuner, H. K. Oliver, John Zundel, Albert W. Berg, Henry Stephen Cutler, William H. Walter, Henry Wilson, William A. King, D. F. Hodges, Richard Storrs Willis, S. P. Tuckerman, H. N. Johnson, H. C. Timm, A. F. Lejial, L. H. Southard, J. H. Wilcox, Joseph Mosenthal, John P. Morgan, A. Kreisemann, Dudley Buck, and many others. Of these, Thomas Hastings and Lowell Mason deserve special mention for their life-long exertion to spread musical knowledge in this country. Many of the hymns of Hastings have retained their place and popularity in Protestant collections. He published in 1822 *A Dissertation on Musical Taste,* which was widely read, and did much toward the improvement of musical culture. Under the influence of Lowell Mason vocal music received an extraordinary impulse in Boston, and throughout New England. Eminent teachers were introduced into the schools; the Boston Academy of Music was established; and music was prescribed as a regular branch of instruction in the schools of Boston, and subsequently throughout the entire country. His published works, particularly the *Carmina Sacra,* were very popular, and are still in circulation. Hastings and Mason were followed by many imitators who made numerous compilations of hymn-books, Sunday-school melodies, glee-books, etc., which were constantly issued, as they proved for many years the most profitable kind of musical publications. In connection with the subject of church-music the *Gospel Hymns* of P. P. Bliss and Ira D. Sankey should not be forgotten. They were introduced at the time of the Moody & Sankey revivals of 1875 and subsequent years, and were published in a cheap edition, which was sold by the million. Among the most popular were "Hold the Fort;" "Almost Persuaded;" "Pull For The Shore;" "What Shall The Harvest Be?" by P. P. Bliss; the "Ninety and Nine," by Ira D. Sankey; "I Need Thee Every Hour," by Robert Lowry; "What a Friend We Have In Jesus," by Charles C. Converse; and the "Sweet Bye-and-Bye," the words of which were written by S. Fillmore Bennett and the music composed by Joseph P. Webster some years before the *Gospel Hymns* were published. These hymns have been severely criticised for catering to an inferior order of musical taste; but they satisfied the popular craving for pleasing melodies, and were of unquestionable benefit to a certain class of people who afterward were led to the cultivation of higher styles of church-music. There is now (1881) a movement in New York to have the scholars of the various Sunday-schools who are musically inclined, meet in some large hall in their section of the city, one or two evenings a week, for the purpose of receiving competent instruction. They will be taught to read notes at sight, and be made familiar with a better class of sacred music. Sigismund Lasar has recently compiled a Congregational hymnal, with selections of the highest class, aiming at the improvement of public taste.

Many societies were founded at the beginning of this century for the cultivation of oratorios in cities like Boston, New York, Philadelphia, Baltimore, and Albany. Of these, the Boston Händel and Haydn society became the most prominent, and is to-day by many considered the leading organization of its kind in America. Between 1820–40 there were a number of oratorio societies in New York, such as the New York Sacred Musical Society; Euterpeon, etc., which produced *The Messiah; The Creation;* Mozart's requiem-masses, and the masterpieces of Haydn and Beethoven. At the present time nearly every large city of the United States has a similar organization; but opera has not made a permanent home in any one place. The first representation of Italian opera was given in New York in 1825, and the troupe included Garcia, and his daughter Malibran. Since then Ullmann, Maretzek, Strakosch, Carl Rosa, Mapleson, and other managers have brought over European artists to give a season of opera in New York and all the large cities. Among singers who have been heard in this country are: M. W. Balfe (1834); John Braham (1840); Jenny Lind (1850); Teresa Parodi (1850); Catherine Hayes (1851); Henrietta Sontag (1852); Marietta Alboni (1852); Grisi and Mario (1854); Adelaide Philipps (1855); Brignoli (1855); Henrietta Eben (1856); Carl Formes (1857); Pauline Colson (1858); Anna Bishop (1858); Adelina Patti (1859); Carlotta Patti (1861); and Parepa-Rosa (1866). Of operatic singers who have visited America in later years are: Christine Nilsson (1871); Pauline Lucca (1872); Campanini (1873); Capoul (1873); Ilma de Murska (1873); Tamberlick (1873); Maurel (1873); Emma Albani (1874); Teresa Titiens (1875); Wachtel (1875); Anna de Belocca (1876); Minnie Hauck (1876); Mme. Pappenheim (1876); and Etelka Gerster (1877). Of American opera-singers, Clara Louise

Kellogg and Annie Louise Cary have achieved considerable reputation; and Emma Albani and Minnie Hauck, though classed by some as foreign singers, were born in this country. English opera was given in this country as early as 1793, when an English troupe performed in Washington and Philadelphia. In 1818 the Phillips company came over, and in 1820 Davis established an opera company in New Orleans. In 1821 Mrs. Holman brought a company to New York. In 1832 came the Woods, and Dunn and Hudson's company. The Seguins came in 1838, and after them the Pyne and Harrison troupe, Madam Bishop, and the Richings opera-troupe. Since then many other companies have been formed; but none have done more for the artistic success of English opera than Clara Louise Kellogg. Among the numerous pianists who have performed in America are: Sigismond Thalberg (1856); Anton Rubinstein (1873); Hans von Bulow (1875); Annette Essipoff (1876); and Rafael Joseffy (1879). It would be difficult to quote the number of excellent American pianists: Louis Moreau Gottschalk, who was born in New Orleans in 1829, and played somewhat in the style of Chopin, was very much admired; and S. B. Mills is ranked as an excellent artist. There have also been a great number of violinists who have played in America—Henry Vieuxtemps (1843); Ole Bull (1844); Camillo Sivori (1846); Camilla Urso (1852); Heinrich Wieniawski (1872); Remenyi (1878); August Wilhelmj (1878). Carl Bergmann, Theodore Thomas, Dr. Leopold Damrosch, Harvey B. Dodworth, and P. S. Gilmore have won distinction as musical conductors. Theodore Thomas established symphony concerts in New York, and finally organized his orchestra which has made him famous in this country and in Europe. The New York philharmonic society, under his leadership, introduces the highest class of music. Among composers who have made a reputation are: Karl Anschütz, George Bristow, F. L. Ritter, Dudley Buck, S. P. Warren, U. C. Hill, Henry C. Watson, A. Bagioli, J. Eichberg, Joseph Mosenthal, Nathan Richardson, Carlo Bassini, Richard Hoffmann, S. B. Mills, G. W. Morgan, Albert W. Berg, H. H. Wollenhaupt, and many others. Although America has not produced a single genius like Beethoven, Chopin, or Verdi, there is one line of composition that has been cultivated with great success, disproving the statement that we are indebted to the foreign element of our population for the music we possess, for the songs that have become the most popular and are endeared to the hearts of our people were composed by Americans. Stephen C. Foster acquired the secret of translating the thoughts, feelings, and sympathies of every-day life into melody. The best-known of his songs is "Old Folks at Home," in which he hoped to rival "Home, Sweet Home," that has become the home-song of the world, and was written by an American author—John Howard Payne. Foster composed many songs which attained great popularity, such as "My Old Kentucky Home;" "Massa's in de Cold, Cold Ground;" "Old Dog Tray;" "Willie, We Have Missed You;" "Ellen Bayne;" "Oh, Susanna;" and "Uncle Ned." All his songs had great pathos and freshness; but "Come Where My Love Lies Dreaming" was his most artistic composition. L. O. Emerson composed "We Are Coming, Father Abraham;" "Out In The Cold." Among his popular sacred songs are: "Stand Up For Jesus;" "Jesus Loves Me;" and his tunes to "Rock of Ages," and "Guide Me, O Thou Great Jehovah," are favorites. George F. Root is the author of the "Battle Cry of Freedom;" "Tramp, Tramp, Tramp;" "Hazel Dell;" and "There's Music In The Air." Harrison Millard composed "Viva l'America," and "Flag of the Free." He is also the author of many ballads, such as "Waiting;" "Under the Daisies;" "When the Tide Comes In;" and "Don't be Sorrowful, Darling." Henry C. Work composed the war songs "Marching through Georgia;" "Kingdom Coming;" "Wake, Nicodemus;" "Grafted into the Army;" "Babylon is Fallen; and "Song of a Thousand Years." He also wrote "Come Home, Father," a temperance song, and "My Grandfather's Clock," which, although of inferior merit, have become very popular. H. P. Danks has composed a large number of songs, of which "Silver Threads among the Gold" is the best known. Septimus Winner, whose *nom de plume* is Alice Hawthorne, wrote "What is Home without a Mother?" "Listen to the Mocking-Bird;" "I've Sailed the Seas Over; or the Song of Enoch Arden," and many others. J. R. Thomas wrote "The Cottage by the Sea;" "Happy be thy Dreams;" "Some One to Love;" and "'Tis but a little Faded Flower." Mathias Keller, composer of the "American Hymn," wrote "Mother, Oh Sing me to Rest,' and "Thine Image," which were very popular in their day.

Theodore Thomas, in a recent magazine article on the "Musical Possibilities of America," states: "The Americans are certainly a music-loving people. At present the musical standard of the American public, taken as a whole, must be pronounced a low one, though we rightly claim for this country a high rank in cultivation. The greater part of the church-music is a sort of patch-work—a little piece from this composer, and another piece from that—put together by an amateur. This low standard of church-music is not owing to the want of competent organists, for we have many of ability; but rather to the fact that they are hampered in their attempts to introduce better music. Recent years have also given us composers of undoubted merit. It is generally acknowledged that we make the best pianos. Our organs are good, and our brass and reed instruments are of a superior quality. But the most noteworthy fact of all is that we are making the best violins. Some of the first living violinists claim that the violins made by George Gemünder are worthy to rank with those of the famous Italian makers, needing only age to prove their great excellence. It will be seen that we have in this country the possibilities of a great musical future. We have the musical taste of the people for music, their strong desire to have the best, and their readiness to recognize what is best when it is presented to them. We have exceptional natural resources for the making of musical instruments. Nature has done her part of the work generously; it remains for us to do ours."

MUSICAL BOX, a case containing mechanism constructed in such a manner that music can be produced automatically. Machines for making mechanical music have been known since the invention of clocks; but real musical boxes were not introduced till after 1750. They have been greatly improved since then, and some of our modern musical-boxes can play over 100 tunes. The mechanism is similar to that of the barrel-organ. The principal parts are the comb, the cylinder, and the regulator. Bells, drums, and castanets are frequently added to produce musical effects, and in such cases the boxes are sometimes termed mandolins, expressives, quatuors, organocleides, piccolos, etc. When they have a combination of reeds and pipes they are known as flutes, celestial voices, and harmoniphones. Large quantities are exported annually of the musical clocks made in the Black Forest and the musical boxes of Prague, and Sainte Susanne in France. The best musical boxes, however, are manufactured at Geneva, Switzerland.

MUSIC RECORDER. Many forms of apparatus have been invented for writing down music in a legible form by the very act of playing it on a keyed instrument, such as the pianoforte or organ. Beginning with 1747, various attempts had been made practically to effect this object, when, in 1863, Mr. Fenby invented and patented his *phonograph* (quite distinct from Bell's phonograph, q.v.), in which he brought in the aid of electro-magnetism. His chief aim, as an improvement on previous apparatus, was to devise a method of denoting the length of the notes, as well as their pitch and the interval between them. On pressing down any key of the instrument, a stud on the under side touches a spring; the spring sets in action a small electro-magnetic apparatus, which causes a tracer to pass against a strip of paper moving onward at a uniform rate by means of a cylinder and clockwork. The paper is chemically prepared, so as to receive a brown stain whenever the tracer passes along its surface. The length of each note is expressed by horizontal dashes of greater or less length, made by the tracer; and the arrangement is such as to denote the lines of the stave as well as the character of the note. By subsidiary adjustments the apparatus is made to express accidental sharps and flats, changes of time, etc.

The abbé Moigno's *phonautograph*, introduced to the British association in 1860, is a contrivance—not for noting down sounds in any kind of musical notation—but for causing a vibrating surface to tell its number and character of vibrations. A kind of spheroidal drum is covered at one end with a diaphragm or stretched membrane; a sheet of paper is carried along this drum-head by means of clockwork; and a system of small levers moves a pen. A tuning-fork, an organ-pipe, or the voice is sounded in proximity to the drum, the body of air within which acts as a re-enforcement of the sound; the membrane vibrates in a manner which can be *felt* by the pen, although not seen by the eye; and the pen makes zigzag markings on the paper. When the sound is produced by a tuning-fork or an organ-pipe, the zigzag lines are so regular that they serve to count the number of vibrations belonging to each particular note. When the sound is that of a singing voice, the markings become very peculiar, especially in words containing the gutturals *r*, *g*, etc. For the more recent PHONOGRAPH, see under that head.

MUSK, or MUSK DEER, *Moschus moschatus*, a ruminant quadruped, the type of the family *moschidæ*. This family differs from *cervidæ* (deer) in the want of horns, and in the long canines of the males, projecting beyond the lips. The musk is an inhabitant of the elevated mountainous regions and table-lands of central Asia. The habits of the musk are very similar to those of the chamois. Its favorite haunts are the tops of pine-covered mountains, but its summer range extends far above the region of pines. Its habits are nocturnal and solitary, and it is extremely timid. It is much pursued by hunters on account of its odoriferous secretion, which has been known in Europe since the 8th c., and is much valued as a perfume. This secretion, *musk*, is produced in a glandular pouch situated in the hinder part of the abdomen of the males; and its natural use seems to be that of increasing sexual attractiveness. The musk-bag is formed by an infolding of a portion of the skin of the belly, within which a number of membranes are contained, and between these membranes are glands by which the musk is secreted. When newly taken from the animal, musk is soft and almost resembles an ointment; it is reddish-brown, and has an excessively powerful odor. Very little of it reaches Europe unadulterated.—Musk is usually imported either in the form of *grain-musk*, that is, the musk which has been collected chiefly from stones upon which it has been deposited by the animal, in which state it is a coarse powder of a dark-brown color; or in the *pod*, that is, in the musk-sack, which is cut altogether from the animal, and dried with the musk inside. Of both kinds the annual importations are about 15,000 ounces per annum, chiefly from China and India. Small quantities are used in medicine, but the greater portion is employed by the perfumers. It is imported in small boxes or catties, often covered with bright-colored silk, and each containing 25 pods. The kinds generally known in trade are the Tonquin or Chinese, which is worth two guineas an oz. in the pod, or £3

10*s.* per oz. in grain; and the Carbardine, Kabardine, or Siberian, which is always imported in pod, and is very inferior, being only worth about 15*s.* an ounce.

The flesh of the musk is sometimes eaten, but has a very strong flavor. The season of migration from the highest and coldest to more temperate regions, is that at which the musk is chiefly pursued.—No other animal of the family *moschidæ* yields the perfume called musk, or has more than a rudimentary musk-bag. The other species of *moschidæ* belong to the genus *tragulus*, and receive the popular name *chevrotain.* They have a very elongated muzzle; and the accessory hoofs assume the form of appressed conical claws. They inhabit the thick woody copses or jungles of the Indian islands, and are the smallest of ruminant quadrupeds. Some of them are not larger than a hare. Their tusks are not so long as those of the musk. One of them, the *napu* of Java and Sumatra, has the smallest blood corpuscles of any known animal.

MUSKALLONGE, or MUSKALLUNGE, the *esox estor* of the *esocidæ* or pike family. It inhabits the North American lakes and the St. Lawrence river. Its length is sometimes 50 inches, often weighing 60 pounds. They are caught, either with hook or net, ranging from a few pounds up to this excessive weight. See PIKE, *ante.*

MUSK DUCK, *Cairina moschata*, a species of duck, of the non-oceanic section of *anatidæ* (see DUCK); of a genus characterized by an elevated tubercle at the base of the bill, the edges of the mandibles sinuated, the face and lores covered with a bare tuberculated skin, the wings furnished with a knob or spur at the bend. The musk duck, or MUSCOVY DUCK—so called, however, through mistake, and receiving its name musk duck more appropriately from its musky smell—is a native of the warm parts of America. It is very plentiful in Guiana, in that part of the year when winter reigns in the north. It is a larger bird than the common duck, in its wild state almost black, with glosses of blue and green, and white wing-coverts, but varies considerably in domestication. It is often to be seen in poultry yards in Britain, but is rather curious than profitable. It hybridizes readily with the common duck, but the hybrid is sterile.—The musk duck of Australia is a very different species, belonging to the genus *biziura.*

MUSKE'GON, a co. in s.w. Michigan, along the shores of lake Michigan; 500 sq.m.; pop. '80, 26,586—17,391 of American birth. It is mostly rolling and fertile prairie, watered by the Muskegon and White rivers, and a number of smaller streams. The principal productions are corn, wheat, and oats, which are grown in nearly equal quantities. It contains a large number of saw-mills, besides carriage shops, metal-ware manufactories, machine shops, sash and blind manufactories, tanneries, and curriers' shops. It is on the line of the Chicago and West Michigan, and the Michigan Lake Shore railroads. Co. seat, Muskegon.

MUSKE'GON, a city in Muskegon co., Mich., on the Muskegon river, near lake Michigan; pop. '70, 8,505. It is on the line of the Lake Shore, the Grand River Valley, and the Muskegon and Big Rapids railroads, and has daily steam communication with Chicago. The preparation and shipment of lumber is the principal business. The transportation of the lumber employs a large number of vessels, and much is sent by rail. The logs float down the Muskegon river into lake Muskegon, which has an area of some 10 sq. miles. More than 300,000,000 ft. of lumber are annually shipped, and there are between 30 and 40 saw-mills. There are also saw manufactories, foundries, and sash and blind factories.

MUSKET, or MUSQUET (Fr. *mousquet;* from *mouchet*, a sparrow-hawk; in the same way that other shooting-implements were named *falcon*, *falconet*, etc.), the fire-arm for infantry soldiers, which succeeded the clumsy arquebuse, and in 1851 gave way before the Enfield rifle, which, in its turn, was converted into Snider's patent breech-loading rifle, now known as the Snider-Enfield; the latter arm, so far as the regular infantry is concerned, has been replaced by the Martini-Henry breech-loader, but the navy, cavalry, and auxiliary forces still retain the Snider. The first muskets were matchlocks; after which came wheel-locks, asnaphans or snap-hance and flint muskets; and lastly, percussion muskets, which were a vast improvement, both for accuracy and lightness, on all which had gone before. Compared, however, to either the Enfield or Martini-Henry rifle, the musket familiarly known as Brown Bess (possibly a corruption of Ger. *büchse*, a hollow tube or gun) was a heavy, ugly, and ineffective weapon. The following is a table of the ranges attained, on an average, by the musket, the Enfield, and the Martini-Henry:

	Musket. Yds.	Enfield Rifle. Yds.	Martini-Henry Rifle. Yds.
Accurate fire	100	600	1200
Effective against detached parties	150	800	1500
Effective against troops in column	200	1000	1800

MUSKETOON', an obsolete weapon, was a short musket of very wide bore, carrying a ball of 5 oz., and sometimes bell-mouthed like a blunderbuss.

MUSK'ETRY, SCHOOLS OF. When the introduction of the Minié rifle in the French service, and the subsequent arming of the British troops with the still more delicate Enfield rifle in 1851, brought the accuracy of a soldier's fire to be an important consideration in estimating his value (which with the old musket was not the case, as it was proverbial that the bullet never hit the point aimed at, however carefully), the English government at once saw the necessity of providing instruction in the manipulation of the rifle. Accordingly, instructors of musketry were attached to the troops, one to each regiment; and a school was established at Hythe in 1854, under the late gen. (then col.) Hay, where lessons on the theory of the arm, and practice in its actual employment, were the sole occupation of the day. Officers and promising men were sent there as fast as the accommodation permitted; and after a course of a few weeks were able to return to their corps, and became instructors to their comrades, so that the shooting of the whole army soon rose in a surprising degree. Whereas, before the establishment of this school, the English stood low in the scale of shooting, the competitions held during recent years at Wimbledon have demonstrated that no nation can now excel them as marksmen. The formation of the volunteer corps, in 1859, led to a greatly increased demand for musketry instruction, which the government met by forming a second school of musketry at Fleetwood (now abandoned), where the troops and volunteers of Scotland, Ireland, and the northern English counties found the necessary teaching. The Hythe school is superintended by a commandant and inspector-general of musketry instruction, with subordinate instructors. The inspector-general is responsible also for the instruction throughout the regiments all over the world, and to him the musketry returns from each regiment are sent annually.

MUSKING'UM, a co. in s.e. central Ohio; drained by the Licking and Muskingum rivers and several creeks; intersected by the Baltimore and Ohio, the Pittsburg, Cincinnati, and St. Louis, and the Muskingum Valley railroads; about 700 sq.m.; pop. '80, 49,780—46,582 of American birth. The surface is undulating, and the soil fertile; there are forests of valuable woodland; wheat, Indian corn, hay, and dairy products are the staples; coal, iron, and limestone are found. The Ohio canal passes through the county; and there are numerous factories of bricks, carriages, saddles and harness, woolen and cotton goods, etc. Co. seat, Zanesville.

MUSKING'UM RIVER, flowing s.e. through Ohio, and emptying into the Ohio river; formed by the junction of the Tuscarawas and Walhonding rivers. The entire length from Coshocton to Marietta is 115 m., and the stream passes through Muskingum, Morgan, and Washington counties, and is navigable as far as Dresden. The river furnishes water-power for many factories at Zanesville and Marietta and elsewhere.

MUSKOKA, an electoral district in Ontario, Canada; 5,300 sq.m.; pop. '70, 6,919. Capital, Bracebridge.

MUSK OX, *Bos moschatus*, or *Ovibos moschatus*, an animal of the family *bovidæ*, regarded as a connecting-link between oxen and sheep. It inhabits the most northern parts of America, enduring the winter even of Melville island and Banks' land; but, like many other animals, it is partially migratory, some individuals or herds seeking more southern regions and better pastures on the approach of winter, while some remain in the furthest north. It is not found in Greenland, Spitzbergen, or Siberia. The musk ox is scarcely equal in size to the smallest of Highland cattle, but appears larger from the profusion of long matted woolen hair with which it is covered, and which hangs almost to the ground. The head is covered with long hair as well as the body, the face alone having short hair. Beneath the long hair there is a thick coat of exquisitely fine wool. The head is large and broad; the forehead convex; the extremity of the muzzle hairy. The horns are very broad at the base, and in the male meet on the forehead; they do not rise but bend down on each side of the head, and curve outwards and upwards towards the tip, which tapers to a sharp point. They are about 2 ft. long measured along the curvature; and about 2 ft. in girth at the base; a pair of them sometimes weighing 60 pounds. The limbs are short, the legs have short hair. The tail is very short, and is covered with long hair, so that it is undistinguishable to the sight. The general color is brown. The female is smaller than the male, has shorter hair on the chest and throat, and smaller horns. The frog of the hoof is short and partially covered with hair; the foot-marks are very similar to those of the reindeer.

The musk ox feeds on grass, twigs, lichens, etc. It is fleet and active, very sure-footed on rocky ground, and ascends or descends very steeps hills with great ease. It is gregarious; the herds generally number 30 or 40. The powerful horns are excellent weapons of defense against wolves and bears, which are often not only repelled but killed. When musk oxen are assailed by firearms, however, they generally huddle more and more closely together, and do not even seek safety by flight, so long as the assailants are unseen. The flesh is much prized by the Esquimaux, but retains much of the strong musky odor which characterizes the living animal. The horns are used for various purposes; particularly the wide base for vessels. The fine wool has been spun and woven into a fabric softer than silk. No attempt has yet been made to domesticate the musk ox; which, however, seems worthy of it, and suitable for all cold regions.

MUSK PLANT, MUSK ROOT, MUSK TREE, MUSK WOOD. Different parts of a number of plants smell more or less strongly of musk. Among these are the common little musk plant (see MIMULUS), the musk-tree of Van Diemen's land (see ASTER), and the musk ochro (see HIBISCUS).—The musk tree of Jamaica (*moschoxylum swartzii*) belongs to the natural order *meliaceæ*. It emits from all parts a smell of musk.—All parts of *guarea grandifolia*, another tree of the same order, a native of the West Indies, sometimes called musk wood, also smells strongly of musk, but particularly the bark, which is used in perfumery.—The drug called MUSK ROOT or SAMBUL is brought from the east, and is the root of a plant supposed to be of the natural order *umbelliferæ;* but the plant is unknown, nor is it certain whether its native country is Persia, or some more remote region of central Asia. It has a pure musky odor, and is used as a substitute for musk.

MUSK RAT, or DESMAN (*mygale* or *galemys*), a genus of insectivorous quadrupeds of the shrew (q.v.) family (*sorecidæ*), differing from the true shrews (*sorex*) in having two very small teeth between the two large incisors of the lower jaw, and the upper incisors flattened and triangular. Behind these incisors are six or seven small teeth (lateral incisors or false canine teeth) and four jagged molars. The muzzle is elongated into a small flexible proboscis, which is constantly in motion. The eyes are very small; there are no external ears; the fur is long, straight, and divergent; the tail long, scaly, and flattened at the sides. All the feet have five toes, fully webbed; and the animals are entirely aquatic, inhabiting lakes and rivers, and making holes in the banks with the entrance from beneath the surface of the water. Only two species are known, one (*M.* or *G. pyrenaica*) about 8 in. long, with tail as long as the body, a native of the streams of the Pyrenees; another larger species (*M.* or *G. moschata*), very plentiful in the Volga and other rivers and lakes of the s. of Russia, nearly equal in size to the common hedgehog, with tail about three-fourths of the length of the body. The Russian desman is blackish above, whitish beneath; it has long silky hair, with a softer felt beneath, and its fur is held in some esteem. Desman skins, however, are chiefly valued on account of the musky odor which they long exhale, and which is derived from a fatty secretion produced by small follicles under the tail of the animal. The desman feeds on leeches, aquatic larvæ, etc., searching for them in the mud by means of its flexible proboscis. It seldom, if ever, voluntarily leaves the water, except in the interior of its burrows, which are sometimes 20 ft. long.

MUSK RAT, *Sorex murinus*, an Indian species of shrew (q.v.), in size about equal to the common brown rat, in form and color much resembling the common shrew of Britain, but remarkable for the powerful musky odor of a secretion which proceeds from glands on its belly and flanks. This odor adheres most pertinaciously to any object with which the animal may come in contact, and provisions are often utterly spoiled by it. Even wine and beer are said to be spoiled by it, in spite of the glass and cork of the bottle, although the probability is much greater that it adheres to the outside of the bottle, and that the liquid is spoiled as it is poured out. One of the Indian names of this animal is *sondeli*

MUSK RAT. See MUSQUASH.

MUSLIN, a cotton fabric of oriental origin, is said to have derived its name from the town of Mosul, in Mesopotamia, where this material was at one time very largely manufactured. At present no such trade exists there; and for muslins, of the common kinds at least, the Indian market depends upon the manufactures of England and France. But no European manufacturer has ever been able to rival the wonderfully fine muslins of Dacca. This does not arise so much from the fineness of the yarn, although that too is very great, but from the marvelous fineness conjoined with a most delicate softness to the touch The fineness of the yarn is so great that until lately no machinery could produce anything like it; a piece of Dacca muslin, shown in the international exhibition (1862), was 31 ft. in length by 3 ft. in width, and contained in a square inch 104 warp threads and 100 weft threads, yet the entire piece weighed only 3¼ ounces. A French manufacturer, M. Thivel Michon of Tavare, has made a muslin of English yarn spun by the Messrs. Houldsworth of Manchester, which surpassed the finest Dacca in the excessive thinness of the yarn, but it wanted its delicate softness. Muslin is much less compact in its texture than calico, indeed it more nearly resembles gauze in appearance; but it is woven plain, without any twisting of the weft threads with those of the warp. The manufacture of muslins in Great Britain and France is very extensive, especially printed muslins, in which the patterns are produced by the same processes as in calico-printing. See WEAVING.

MUSNUD, a Persian throne of state.

MUSOPHA'GIDÆ. See PLANTAIN-EATER.

MUS'PRATT, JAMES SHERIDAN, PH.D., 1821–71; b. Ireland; when a boy made a tour on the continent, and studied chemistry with prof. Graham of Glasgow. In 1838 he possessed sufficient knowledge of chemistry to take charge of the chemical department of a large Manchester manufactory. After an unsuccessful business experiment in America, he resolved to devote himself entirely to the study of chemistry, which he pursued under Liebig, at Giessen, 1843–45. There he published an edition of Plattner's *Treatise on the Blowpipe*, and took the degree of PH.D., with a thesis tracing the resemblance between the carbonates and sulphites. In 1847 he produced a number of new substances from the sulpho-cyanides of ethyl and methyl. On his return to England in 1848 he established and became superintendent of a college of chemistry at Liverpool. From 1854 to 1860 he was engaged on a dictionary of chemistry, which was also published in this country and translated into French and German. His *Outlines of Quantitative Analysis for Students* has had a considerable circulation.

MUS'QUASH, MUSK-RAT, or ONDATRA, *Fiber zibethicus*, a rodent quadruped, a native of North America. It is the only known species of the genus to which it belongs which is characterized by dentition similar to that of the voles; in some other characters more nearly agreeing with the beaver. The musquash is in shape nearly similar to the brown rat; the head and body are about 15 in. in length, the tail 10 inches. The whole body is covered with a short downy dark-brown fur, intermixed with longer and coarser hairs. It is common in almost all parts of North America, from lat. 30° to lat. 69°, except in the southern alluvial districts. It is a very aquatic animal, seldom wandering from the rivers, lakes, or marshes in which it makes its abode. The fur is in demand, and forms an article of commerce—skins in large number being still exported from America to Britain and other European countries. The musquash burrows in the banks of streams and ponds; the entrances of its burrows being always under water, so that it must dive to reach them. In marshes the musquash builds a kind of hut, collecting coarse grasses and mud, and raising the fabric from 2 to 4 ft. above the water. The flesh of the musquash, at those seasons when it is fat, is in some request among the American Indians, and is said to be not unpalatable.

MUSSEL, *Mytilus*, a genus of lamellibranchiate mollusks, the type of the family *mytilidæ*, which, however, is much more restricted than the Linnæan genus *mytilus*. The *mytilidæ* belong to the division of *lamellibranchiata*, called by Lamarck *dimyaria*, having two *adductor* muscles—muscles employed in closing the valves of the shell. The mantle has a distinct anal orifice; the foot is small; and there is a large *byssus* (q.v.), which is divided into fibers to its base. The valves of the shell are equal; the hinge is destitute of teeth. Some, but few, of the species are found in fresh water. See DREISSENA. Some (*lithodomus*) burrow in stone. How they do it is utterly unknown, but they do burrow even in the hardest stone; and some small tropical species excavate for themselves holes in the shells of great limpets. The *lithodomi* are sometimes called *date-shells*. Some of them are very beautiful, which is the case also with the true mussels, after the epidermis is removed. Even the COMMON MUSSEL (*M. edulis*) then exhibits beautiful veins of blue. This species is very abundant on the British coasts, and is much used as bait by fishermen. It is gregarious, and is found in vast beds, closely crowded, adhering by the byssus to rocks, etc. These beds are usually uncovered at low water. The shell is oblong; at its greatest size about 3 in. long, and an inch and a half broad. Mussels, when young, move about by means of the foot, with which they lay hold of objects and drag themselves along, until they find some suitable spot to anchor themselves by a byssus. If detached, they soon find another anchorage. In an aquarium they readily attach their byssus-threads even to the smooth glass, and the threads may be broken more easily than separated from the glass. An ingenious and important application of the strength of these threads has been made by the French, to render Cherbourg breakwater more secure by binding the loose stones together, for which purpose it was *planted* with tons of mussels. The common mussel is much used as an article of food, and is generally found quite wholesome; yet it sometimes proves poisonous, particularly in spring and summer, either causing blotches, swellings, and an eruption, accompanied with asthma, or a kind of paralysis, and even sometimes producing delirium and death. For the FRESH-WATER MUSSEL, see that article.

MUS'SELBURGH, a small sea-port and royal and parliamentary burgh of Scotland, in the county of Edinburgh, is situated at the mouth of the Esk, 6 m. e. of Edinburgh. On the west side of the Esk is the fishing village of Fisherrow. Tanning, leather-dressing, and the manufacture of sail-cloth, nets, and salt are carried on. The harbor at Fisherrow is frequented by coasting craft, and by small vessels from Holland and the Baltic. Timber, oil-cake, bark, seeds, and hides are imported; coal is the chief export. On the "links," a famous golfing ground, the Edinburgh races take place annually. Musselburgh unites with Leith and Portobello in sending a member to parliament. Pop. '71, 7,517.

MUSSET, LOUIS CHARLES ALFRED DE, one of the foremost of recent French poets, was b. at Paris Nov. 11, 1810. He studied in succession medicine, law, finance, and painting; but finally, under the influence of the romantic school (q.v.), devoted himself to poetry. The first work that attracted notice was *Les Contes d'Espagne et d'Italie* (1830), which by their elegant but audacious sensuousness gave deep offense. *Le Spectacle dans un Fauteuil* (1832) is a strange medley of contrasts. *Les Nuits* (1840) admittedly show his lyrical power at its best. Many of the *Comédies et Proverbs* were popular on the stage; and Musset wrote several prose romances. In 1852 he was admitted to the French academy. He died at Paris May 2, 1857. The exquisite beauty, tenderness, and power of much of Musset's work is continually marred by the morbid pessimism of a man prematurely old, disillusioned, *blasé*; on this very ground Musset is often regarded as the representative poet of the modern Parisian

MUSSEY, REUBEN DIMOND, an American surgeon; b. N. H., 1780; d. Boston, 1866; graduated at Dartmouth, 1803; Philadelphia 1809; practiced medicine and surgery at Salem 1809–14; professor of practice of medicine at Dartmouth 1814–19, and of anatomy and surgery from the latter date to 1838, when he removed to Cincinnati and became professor of surgery in the Cincinnati college of medicine and surgery, occupying the chair till 1852, when he was appointed professor of surgery in the Miami medical college, where he remained till 1860, when he removed to Boston. He was a bold and successful operator, and was the first to ligate both common carotid arteries, an operation which was successful in its results.

MUSSULMÁN, *Mosleman*, a Mohammedan (from Arab. *Salama*), equivalent to Moslem, of which word it is, properly speaking, the plural; used in Persian fashion for the singular. We need hardly add that this Arabic plural termination of "án" has nothing whatever to do with our word *man*, and that a further English plural in *men* is both barbarous and absurd.

MUSTANG. See HORSE.

MUSTARD, *Sinapis*, a genus of plants of the natural order *cruciferæ*, having yellow flowers, and linear or oblong pods, which terminate in a sword-shaped and compressed or 4-cornered beak, and contain one row of seeds. The seeds are globular, and their cotyledons (q.v.) conduplicate.—The most important species is BLACK MUSTARD (*S. nigra*), an annual, which grows wild in fields and by waysides in the middle and south of Europe, and is not uncommon in the southern parts of Britain. Its pods are bluntly 4-angled, smooth, erect, and lie close to the stem, their valves 1-nerved; the leaves are smooth, the lower leaves lyrate, the upper leave linear-lanceolate. The seeds are brownish black.—WHITE MUSTARD (*S. alba*), also a native of most parts of Europe, and of the southern parts of Britain, is an annual, having divergent pods covered with stiff hairs, the valves 5-nerved, the seeds yellowish, the leaves pinnatifid.—Both these species are cultivated in England and elsewhere, for their seeds, which are ground into powder and mixed with water, to make the well-known condiment called *mustard*. The powder of the seeds is also much used in medicine as a rubefacient. The use of mustard as a condiment is often found favorable to digestion. Mustard seeds depend for their pungency on a principlewhich, when water is added to black mustard, forms *volatile oil of mustard*. (See next article.) There is also in the seeds a bland fixed oil, *oil of mustard*, which is obtained from them by expression, and constitutes about 28 per cent of their weight. The cake which remains after the oil is expressed is too acrid to be freely used for feeding cattle. It is black mustard which is chiefly cultivated, its seeds being more pungent and powerful than that of white mustard; but there is more difficulty in removing the skin of its seed than that of white mustard, which is therefore often preferred, but more in England than on the continent of Europe. Mustard requires a very rich soil. It is cultivated on the alluvial lands of the level eastern counties of England. Wisbeach, in Cambridgeshire, is the great mustard market of England.—White mustard is often sown in gardens and forced in hot-houses, to be used in the seed-leaf as a small salad, having a pleasant pungency. It is also sometimes sown for feeding sheep, when turnip or rape has failed, being of very rapid growth, although inferior in quantity of crop.—WILD MUSTARD, or CHARLOCK (*S. arvensis*), which is distinguished by turgid and knotty pods with many angles and longer than the two-edged beak, is a most troublesome annual weed in cornfields in Britain, often making them yellow with its flowers in the beginning of summer. Its seeds are said to have yielded the original *Durham mustard*, and are still gathered for mixing with those of the cultivated species. The bland oil of the seeds is used for lamps. —PEKIN MUSTARD (*S. Pekinensis*) is an annual, very extensively cultivated in China, its leaves being used as greens. It is quite hardy in the climate of Britain.—INDIAN MUSTARD (*S. ramosa*) is extensively cultivated in India for its seeds, which are used as a condiment; as are those of *S. dichotoma* and *S. glauca*, also cultivated in India. The oil of the seeds is much used throughout India for lamps.—HILL MUSTARD is a different genus, *bunias* (q.v.)—The MUSTARD TREE of Scripture is supposed to be *salvadora Persica*, a small tree of the natural order *salvadoraceæ*, a small order allied to *myrsinaceæ*. It abounds in many parts of the east. The seed has no aromatic pungency, and is used like mustard. The fruit is a berry with a pungent taste.

Manufacture.—The manufacture of mustard as it was originally used in this country, and as it still is on the continent, consisted in simply grinding the seed into a very fine meal. A false taste, however, arose for having an improved color, and the flour of mustard was introduced, in which only the interior portion of the seed is used, the husk being separated, as the bran is from wheaten flour. This causes a great loss of flavor, as the pungent oil, on which the flavor chiefly depends, exists in greatest abundance in the husk.—Hence other materials, such as capsicum powder, and other very pungent matters, are added to bring up the flavor, and wheaten flour and other substances are added to increase the bulk and the lightness of color. Indeed, so many sophistications have been added that the mustard of the English tables can no longer be regarded in any other light than an elaborately compounded condiment, for which each manufacturer has his own particular recipe.

MUSTARD, OIL OF. The seeds both of the black and the white mustard yield by expression a large quantity of a bland fixed oil, but they do not contain any essential or volatile oil ready formed. It is only the black mustard which by distillation yields the compound usually known as the oil or essence of mustard, and which is in reality sulphocyanide of allyl (see GARLIC, OIL OF) contaminated with a little brown resinous matter, from which it may be freed by simple re-distillation.

When first obtained, it is a colorless fluid, which gradually becomes yellowish. It has a painfully pungent odor and acrid taste; and when applied to the skin, it speedily raises a blister. It is soluble in all proportions in alcohol, but dissolves very sparingly in water. In the article already referred to, it has been shown that this oil and oil of garlic are naturally convertible into one another; in combination with ammonia it forms a compound which is termed *thiosinnamine*, and which combines directly with acids like a true organic base. Its mode of formation is explained by the equation:

$$\overbrace{C_6H_5,C_2NS_2}^{\text{Oil of Mustard.}} + \overbrace{NH_3}^{\text{Ammonia.}} = \overbrace{C_8H_8N_2S_2}^{\text{Thiosinnamine.}}$$

By digesting oil of mustard with alkalies, or with hydrated oxide of lead, we also obtain a feeble base termed *sinapoline*, whose formula is $C_{14}H_{12}N_2O_2$.

The oil is formed in much the same way as the volatile oil of almonds (q.v.) The black mustard contains the potash salt of a compound termed *myronic acid*, and a peculiar coagulable nitrogenous ferment, which, when the crushed seed is moistened with water, act upon each other, and develop the oil. It is the gradual formation of this oil, when powdered mustard and warm water are mixed, that occasions the special action of the common mustard poultice. The pungency of mustard as a condiment, of horse-radish, etc., is mainly due to the presence of this oil.

MUSTELIDÆ, a family of digitigrade carnivora (q.v)., mostly forming the genus *mustela* of Linnæus; now divided into a number of genera, in which are ranked the weasel, ermine or stoat, sable, marten, ferret, polecat, mink, skunk, etc. The mustelidæ are distinguished by the elongated form of the body and the shortness of the limbs; also by having generally four or five molars on each side in the upper jaw, and five or six in the lower. On each side of both jaws there is a single tuberculate tooth. All the feet have five toes. The skull is much elongated behind the eyes. The mustelidæ display great litheness and suppleness of movement. They are very carnivorous. Otters are ranked among the mustelidæ.

MUSTER (It. *mostrare*, from Lat. *monstrare*, to show) is a calling over of the names of all the men composing a regiment or a ship's company. Each man present answers to his name, those not answering being returned as absent. The muster-roll from which the names are called is the pay-master's voucher for the pay he issues, and must be signed by the commanding officer, the adjutant, and himself. The crime of signing a false muster-roll, or of personating another individual at a muster, is held most severely punishable—by imprisonment and flogging for a common soldier, by immediate cashiering in the case of an officer. In regiments of the line a muster is taken on the 24th of each month; in ships of war, weekly. The muster after a battle is a melancholy proceeding, intended to show the casualities death has wrought. In early times, before the army was a standing force, and when each captain was a sort of contractor to the crown for so many men, the muster was most important as the only security the sovereign had that he really obtained the services of the number of men for whom he paid. Accordingly, any fraud, as making a false return, or as mustering with his troop men not actually serving in it, was by the articles of war of Henry V. made punishable with death for the second offense, and by Charles I. with death "without mercy" for even the first such crime; while any person abetting in any way in the fraud shared the penalty.

MUTE, a small instrument used to modify the sound of the violin or violoncello. It is made of hard wood, ivory, or brass, and is attached to the bridge by means of a slit, a leg of it being interjected between every two strings. The use of the mute both softens the tone and imparts to it a peculiar muffled and tremulous quality, which is sometimes very effective. Its application is indicated by the letters *c.s.*, or *con sordino*, and its discontinuance by *s.s.*, or *senza sordino*. The mute is sometimes used for the cornet, being inserted into the bell of the instrument, thereby subduing the sound and producing the effect of great distance.

MUTINY (Fr. *mutiner*, from *mutin*, "riotous." "Mutin" is connected with the old French *meute*, still seen in *émeute*, a "sedition," and is therefore from the Latin *movere*, "to move" or "stir up." The supposition that the word is derived from the Latin *mutio*, a "muttering," is a mistake). The term is used to denote behavior either by word or deed subversive of discipline, or tending to undermine superior authority. Till lately mutiny comprised speaking disrespectfully of the sovereign, royal family, or general commanding, quarreling, and resisting arrest while quarreling; but these offenses have now been reduced to the lesser crime of "mutinous conduct." The acts now constituting mutiny proper are exciting, causing, or joining in any mutiny or sedition; when present thereat, failing to use the utmort effort to suppress it; when, knowing of a mutiny or intended mutiny, failing to give notice of it to the commanding officer; striking a superior officer, or using or offering any violence against him while in the execution of his duty: disobeying the lawful command of a superior officer. The punishment awarded by the mutiny act to these crimes is, if the culprit be an officer, death or such other punishment as a general court-martial shall award; if a soldier, death, penal servitude for not less than four years, or such other punishment as a general court-martial shall award. As the crime of mutiny has a tendency to immediately destroy all authority and all cohesion in the naval or military body, commanding officers have strong powers to stop it summarily. A drum-head court-martial may sentence an offender, and if the case be urgent, and the spread of the mutiny apprehended, the immediate execution of the mutineer may follow within a few minutes of the detection of his crime. It, however, behooves commanding officers to exercise this extraordinary power with great caution, as the use of so absolute an authority is narrowly and jealously watched. To prevent mutiny among men the officers should be strict without harshness, kind without familiarity, attentive to all the just rights of their subordinates, and, above all things, most particular in the carrying out to the very letter of any promise they may have made.

MUTINY ACT was an act of the British parliament passed from year to year, investing the crown with powers to regulate the government of the army and navy, and to frame the articles of war. By the bill of rights, the maintenance of a standing army in time of peace, unless by consent of parliament, was declared illegal, and from that time the number of troops to be maintained, and the cost of the different branches of the service, have been regulated by an annual vote of the house of commons. But parliament possesses a further and very important source of control over the army. Soldiers, in time of war or rebellion, being subject to martial law, may be punished for mutiny or desertion; but the occurrence of a mutiny in certain Scotch regiments soon after the revolution, raised the question whether military discipline could be maintained in time of peace; and it was decided by the courts of law, that, in the absence of any statute to enforce discipline and punish military offenses, a soldier was only amenable to the common law of the country: if he deserted, he was only liable for breach of contract, or if he struck his officer, to an indictment for assault. The authority of the legislature thus became indispensable to the maintenance of military discipline, and parliament has, since 1689, at the beginning of every session, conferred this and other powers in an act called the mutiny act, limited in its duration to a year. Although it is greatly changed from the form in which it first passed, 175 years ago, the annual alterations in this act are now very slight, and substantially it has a fixed form. The preamble starts with the above quoted declaration from the bill of rights, and adds that it is judged necessary by the sovereign and parliament that a force of such a number should be continued, "for the safety of the United Kingdom, the defense of the possessions of the crown;" while it gives authority to the sovereign to enact articles of war for the control and government of the force granted. The act comprises 107 clauses, of which the first five specify the persons liable to its provisions—viz., all enlisted soldiers or commissioned officers on full pay, and to those of the regular army, militia, or yeomanry, when employed on active service, and to recruits for the militia while under training. Clauses 6 to 14 treat of courts-martial, their procedure and powers. Clauses 15 to 28 relate to crimes and their punishment, the leading offenses being mutiny, desertion, cowardice, treason, insubordination, for each of which death may be the penalty; frauds, embezzlement, etc., for which penal servitude is awarded. Clauses 29 to 33 provide for the government of military prisons, and for the reception of soldiers in civil jails, under the sentences of courts-martial. Clauses 34 to 37 enact rules to guide civil magistrates in apprehending deserters or persons suspected of desertion. Clause 38 refers to furlough; 39 to 41, on the privileges of soldiers, enact that officers may not be sheriffs or mayors; that no person acquitted or convicted by a civil magistrate or jury be tried by court-martial for the same offense; and that soldiers can only be taken out of the service for debts above £30, and for felony or misdemeanor. Clauses 42 to 59 have reference to enlistment (q.v.); 60 to 74 to stoppages, billets, carriages, and ferries, providing for the compulsory conveyance and entertainment of troops by innkeepers. Clause 75 relates to the discharge of soldiers; and the remaining 28 clauses advert to miscellaneous matters, and the penalties under the act on civil functionaries who neglect to comply with its requirements. By clauses 105 and 106 the militia, yeomanry, and volunteers, may, on emergency, be attached to the regular forces. Clause 107 renders a soldier liable to maintain his wife and children, and his bastard children.

MUTIUS SCÆVOLA. See Mucius Scævola.

MUTSUHITO or Muts-hito. The present reigning emperor of Japan, and the 123d mikado of the line. His name means the "man of peace," or "weak man." He has no family name. He is the second son of the mikado Komei Tennō (1847–67); his mother Fujiwara Asako. He was born Nov. 3, 1850, and grew up in the palace at Kioto, never seeing a foreigner until his nineteenth year. On the death of his father Jan. 30, 1867, he was declared emperor under the care of a regent. Upon the *coup d'etat* of Iwakura and others, Jan. 3, 1868, the regent was dismissed. Mutsuhito became the active mikado, and the new government was proclaimed; the decree abolishing forever the office of "tycoon" being dated Feb. 4. On March 23 he gave the first audience ever granted by an emperor of Japan to representatives of Christian nations, the envoys of France and Holland being admitted. The British minister (see Parker, Sir H. S.) who on the 27th attempted a similar audience, had his cortege attacked by assassins. On March 28 the imperial decree was issued by which treaty relations with foreign nations were for the first time acknowledged by the mikado, and all fanatics who should attack foreigners were outlawed. On April 6, in the great hall of the castle of Nijo in Kioto, occurred the most momentous act of his life, and thence dates the real beginning of modern Japan. In presence of the court nobles, and feudal princes (daimios) the mikado took the oath which is now the basis of the new government. The first clause of this oath is as follows: "The practice of discussion and debate shall be universally adopted, and all measures shall be adopted by public argument." Besides this he promised that the "uncivilized customs of former times" should be broken through, and intellect and learning sought for throughout the world, to assist in leading Japan into the path of modern civilization. From this oath the reforms of the past twelve years have proceeded, and the drift of Japanese politics toward constitutional government has begun. On Feb. 7, 1869, he removed the national capital to Tókio, and soon after married Ichijo Tadaka, a noble lady of the 2d degree of the 1st rank. In 1872 he adopted European dress and habits of life, and has since made many tours throughout the empire, completely revolutionizing the old traditional court and governmental etiquette.

MUTTRA, or Mathurá, a t. of British India, capital of a district in the n.w. provinces, 97 m. s.s.e. of Delhi, is situated on the right bank of the Jumna. The fort was built by the celebrated astronomer, Jey Singh (who became prince of Amber in 1693); and on the roof of one of the apartments is a ruinous observatory, containing a great number of astronomical instruments. Access is had to the river—which, along with the town, is considered sacred by the Hindus—by numerous ghâts, ornamented with little temples; and its banks are, every morning and evening, crowded by devotees of all ages and both sexes, to perform their religious exercises. In Hindu mythology, it is regarded as the birthplace of the divinity Krishna. In honor of the monkey-god Hanuman, monkeys are here protected and fed, being allowed to swarm everywhere. There are also great numbers of paroquets, peacocks, and sacred bulls at large, without owners. There is a very extensive military cantonment about a mile s. of the town. Muttra appears at an early period to have been of much more importance than it is at present; and its enormous wealth and splendor made it an object of attack to the first Afghan invaders. Mahmud of Ghuznee, in 1017, gave it up to plunder, breaking down and burning all the idols, and amassing a vast quantity of gold and silver, of which the idols were made. After this calamity, it sank into comparative obscurity. In Oct., 1803, it was, without resistance, occupied by the British troops. Pop. '72, 59,281.

MU'TUAL INSTRUCTION. See Monitorial System.

MU'TULE, a plain block under the corona of the cornice of the Doric style, similar in position to the modallio of the Corinthian order, and having a number of guttæ or drops worked on the under side. See Entablature.

MU'TUUM is a term used in Scotch law, borrowed from the Roman law, to denote a contract of loan of a certain kind of things, as corn, wine, money, which are consumed in the use, and as to which the borrower is bound to restore as much of the same kind at some future time.

MUYSCAS, or Chibchas, a nation of Indians w. of the Andes, in New Granada, as far as the vicinity of Santa Fé de Bogota. They seem to have been the nearest in civilization to the Quichuans. They were quickly Christianized, and, like all these tribes, on the expulsion of the Jesuits, decreased rapidly in numbers and intelligence. It seems uncertain whether the language is really extinct, but it was simple, and is usually considered unconnected with any neighboring group.

MUZA IBN NOSEYR, the Arab conqueror of Spain, was born 640 A.D. He displayed great bravery and high military talents in the contests of that turbulent period, so much so that he was appointed by the caliph general of the army which was raised for the conquest of Africa in 698–99. After an insignificant expedition into the interior of Africa, he set out in 707 for Mauritania, conquering the kindred tribes of eastern Barbary, and enrolling their warriors under his standard; and by 709 the whole of northern Africa, including the Gothic strongholds on the coast, acknowledged the authority of the caliph. At this period the Gothic monarchy in Spain was in a state of complete disorganization, and Muza Ibn' Noseyr, seizing the favorable opportunity thus presented, sent his lieut., Tarik Ibn Zeiad, in April, 711, to make an incursion into Spain. Tarik landed at Gibraltar, marched inland to the banks of the Guadalete, where he was met bp Roderic the Gothic king. In the battle which ensued the Goths were decisively vanquished, their king perished in the waters of the Guadalete, and the whole of southern Spain lay at the mercy of the victor. Muza Ibn Noseyr, on hearing of these successes, sent orders to Tarik to halt for further instructions; but the lieutenant, flushed with success, pressed on to the very center of Spain, and seized Toledo, the capital of the Gothic kingdom. Muza Ibn Noseyr immediately set out for Spain at the head of 18,000 men (June, 712), took Seville, Carmona, Merida, and other towns, and then marched upon Toledo, where he joined Tarik, whom he caused to be bastinadoed and incarcerated, but afterwards reinstated in obedience to an order from the caliph. Muza Ibn Noseyr then marched first n.w. and then e., subduing the country as he went; he then crossed the Pyrenees into France, but soon after returned to Spain, where he and Tarik received messages from the caliph, commanding their immediate presence at

Damascus; Tarik immediately obeyed, but Muza Ibn Noseyr delayed till a second message was sent to him. On reaching Damascus he was treated with neglect, and, on the accession of the caliph Suleiman, was cast into prison, and mulcted in 200,000 pieces of gold; his two sons were deprived of their governments of Kairwan and Tangier; and the third son, who governed Spain in his father's absence, was beheaded, and his head sent to Muza. Muza Ibn Noseyr died soon after in the greatest poverty, at Hedjaz, 717 A.D.

MUZIANO, GIROLAMO, 1528-90; b. Aquafredda, near Brescia, Italy; hence his title, Bressano, or Brescianino. His first instructor was the painter Girolamo Romanino. He afterwards studied at Venice and Rome, and devoted himself to the painting of landscapes. His earliest important painting, "The Resurrection of Lazarus," attracted the attention of Michael Angelo, who was so struck by its bold and accurate design that he took Muziano under his protection and secured for him a large number of commissions. Muziano made a study of mosaics, and vastly improved that branch of art. He founded and richly endowed the famous academy of St. Luke. The most of his pictures are in the churches and palaces of Rome, where he spent the larger part of his life. Among them may be mentioned: "St. Jerome," and a "Descent from the Cross" (Borghese palace); "St. Jerome" (Doria palace); "St. Francis" (Mattei palace); "Resurrection of Lazarus" (Vatican); "St. Matthew and St. Paul" (Ara Coeli); "Annunciation" (St. Urban's); "Nativity of Jesus Christ" (Madonna de' Monti); "St. Nicholas" (St. Louis-des-Français); "Cristo Morto" (Santa Cattarina); "Jesus Christ giving the Keys to St. Peter," and a "Flagellation" (in the sacristy of St. Peter's). His frescos are to be seen in the Vatican, at Foligno, etc. The galleries of Bologna, Dresden, Reims, and the Louvre possess specimens of Muziano's work. His designs in India ink are highly prized. He is distinguished for his excellence in design and coloring; for the nobility of his conceptions, and the characteristic expression of his faces. His frescos are sometimes rather sharp and hard in outline and color. Died in Rome, honored as one of the greatest painters in the school of Michael Angelo.

MUZZEY, ARTEMAS BOWERS, b. Mass., 1802; educated at Harvard college and the Harvard divinity school. He was settled over the Unitarian church in Framingham in 1830, and was afterwards minister of Unitarian churches in Cambridgeport, Cambridge, and Concord, N. H. His last charge was at Newburyport, Mass., where he remained till 1865, when he retired from the pulpit. Among his numerous works, aside from sermons and tracts, may be mentioned: *The Young Man's Friend*, 1836; *The Young Maiden*, 1840, which had a great success; *Man a Soul*, 1842; *The Sabbath-School Hymn and Tune Book*, 1855; *The Blade and the Ear*, 1864; and *The Higher Education*, 1871.

MYACITES, a genus of extinct lamellibranchiate mollusks, belonging to the family *anatinidæ*. They commenced their existence in the Silurian formation, and extended through the triassic and Jurassic into the cretaceous, where they became extinct. They had a gaping ventricose shell, with an external ligament.

MYCALE, the ancient name of a mountain now called Samsun, in the s. of Ionia in Asia Minor. It terminates in the promontory cape Santa Maria, opposite the island of Samos. The strait between the island and the promontory is where the great naval victory of the Greeks over the Persians took place 479 B.C.

MYCE'LIUM, in botany, a development of vegetable life peculiar to *fungi*, but apparently common to all the species of that order. The *spawn* of mushrooms is the mycelium. The mycelium appears to be a provision for the propagation of the plant where its spores may not reach, its extension in the soil or matrix in which it exists, and its preservation when circumstances are unfavorable to its further development. It consists of elongated filaments, simple or jointed, situated either within the matrix or upon its surface. It is often membranous or pulpy. The development of the fungus in its proper form seems to be ready to take place, in proper circumstances, from any part of the mycelium. Fungi often remain long in the state of mycelium, and many kinds of mycelium have been described as distinct species and formed into genera. Fries has rendered great service to botany in investigating these spurious species and genera, and determining their true nature. Liquors in which the flocculent mycelius of a fungus is spreading are said to be *mothery*.

MYCE'NÆ, a very ancient city in the north-eastern part of Argolis, in the Peloponnesus, built upon a craggy height, is said to have been founded by Perseus. It was the capital of Agamemnon's kingdom, and was at that time the principal city in Greece. About 468 B.C., it was destroyed by the inhabitants of Argos, and never rose again from its ruins to anything like its former prosperity. In Strabo's time its ruins only remained; these are still to be seen in the neighborhood of Kharvati, and are specimens of Cyclopean architecture. The most celebrated is the "Gate of Lions," the chief entrance to the ancient Acropolis. Excavations prosecuted at Mycenæ by Dr. Henry Schliemann brought to light in 1876 several ancient tombs, containing a large quantity of gold and silver ornaments, etc.

MYCETES, a genus of South American monkeys. See HOWLER, *ante*.

MYELI'TIS (*myelos*, marrow), is the term employed to signify inflammation of the substance of the spinal cord. It may be either acute or chronic, but the latter is by far the most common affection. The *chronic* form begins with a little uneasiness in the spine, somewhat disordered sensations in the extremities, and unusual fatigue after any slight exertion. After a short time paralytic symptoms appear, and slowly increase. The gait becomes uncertain and tottering, and at length the limbs fail to support the body. The paralysis finally attacks the bladder and rectum, and the evacuations are discharged involuntarily; and death takes place as the result of exhaustion, or occasionally of asphyxia if the paralysis involves the chest. In the *acute* form there is much pain (especially in the spinal region), which usually ceases when paralysis supervenes. The other symptons are the same as those of the chronic form, but they occur more rapidly and with greater severity, and death sometimes takes place in a few days.

The most common causes of this disease are falls, blows, and strains from over-exertion; but sexual abuses and intemperate habits occasionally induce it. It may also result from other diseases of the spine (as caries), or may be propagated from inflammation of the corresponding tissue of the brain.

The treatment, which is much the same as that of inflammation elsewhere, must be confided entirely to the medical practitioner; and it is therefore unnecessary to enter into any details regarding it. When confirmed paralysis has set in, there is little to hope for. but in the early stage the disease is often checked by judicious remedies.

MYENSK, a t. of European Russia, in the government of Orel, on the Zusho. It has thirteen churches, and a pop. of nearly 13,000. It has a lively trade chiefly in spirits, soap, hemp, and dried fruits.

MYER, ALBERT J., 1828–80, b. N. Y.; son of a jeweler who established himself in that business in Buffalo, N. Y., while Albert was a child. He graduated at Hobart college, Geneva, N. Y., in 1847; and, returning to Buffalo, began the study of medicine with Dr. Frank H. Hamilton, and took his degree of M.D., at the university of Buffalo in 1851. In 1854 he was appointed assistant surgeon in the U. S. army, and assigned to Texas, where he first developed his now celebrated signal system, and which was adopted by the secretary of war for the use of the army. From 1858 to '60 Myer was a signal officer with the rank of major. On the outbreak of the war he was made signal officer on the staff of gen. Butler, and afterwards on that of gen. McClellan, and was successively brevetted lieut.col., col., and brig.gen.; his last promotion being for "distinguished services in organizing, instructing, and commanding the signal corps of the army, and for especial service on Oct. 5, 1864, at Allatoona, Ga.;" on July 28, 1866, he was made colonel in the regular army and chief signal officer. In 1870 he commenced his work of observing and giving notice by telegraph of the approach and force of storms on the northern lakes and sea-coast, at the military post in the interior, and at other points in the states and territories. He organized the meteorological division of the signal service, and in 1873, by special act of congress, was placed in charge of the telegraphic duties in this connection, and authorized to establish signal stations at lighthouses and live-saving stations. In the same year he was a delegate to the meteorological congress held in Vienna. Gen. Myer published *A Manual of Signals for the United States Army*. On the last day of the last session of Congress before his death he received his promotion to the full rank of brig.gen. of the U. S. army. On account of the publication in the leading newspapers, of the daily telegraphic prognostications of the weather-bureau, under the head of "probabilities"; gen. Myer was familiarly and playfully known by the name "old probabilities."

MYERS, PETER HAMILTON, b. N. Y. 1812; made his first appearance as an author, in 1843, when he published *The First of the Knickerbockers, a Tale of* 1673. He has since written a number of novels, among which are *The Young Patroon*, 1848; *The King of the Hurons;* and *The Prisoner of the Border*, 1857. He has published also a book of poems called *Ensenore, a Romance of Owasco Lake.*

MYGALE, a genus of spiders, the type of a family *Mygalidæ*. They have four pulmonary sacs and spiracles, four spinnerets, eight eyes, and hairy legs. They make silken nests in clefts of trees, rocks, etc., or in the ground, sometimes burrowing to a great depth, and very tortuously. To this genus belongs the bird-catching spider (q.v.) of Surinam; but it seems now to be ascertained that several of the larger species frequently prey on small vertebrate animals. They do not take their prey by means of webs, but hunt for it and pounce upon it by surprise. They construct a silken dwelling for themselves in some sheltered retreat. Some of them make a curious lid to their nest or burrow. They envelop their eggs, which are numerous, in a kind of cocoon.

MYLA'BRIS, a genus of coleopterous insects, nearly allied to *Cantharis* (q.v.), and deserving of notice because of the use made of some of the species as blistering flies. *M. cichorii* is thus used in China and India; and *M. Fuesselini*, a native of the south of Europe, is supposed to have been the blistering fly of the ancients.

MYLI'TTA (? corresponding to Heb. *Meyaledeth*, Genitrix, who causes to bear), a female deity, apparently first worshiped among the Babylonians, who gradually spread her worship through Assyria and Persia. She is originally, like almost every other mythological deity, a cosmic symbol, and represents the female portion of the twofold principles through which all creation burst into existence, and which alone, by its united active and passive powers, upholds it. Mylitta is to a certain degree the representative of earth, the mother, who conceives from the sun, Bel or Baal. Mylitta and Baal together are considered the type of the "Good." Procreation thus being the basis of Mylitta's office in nature, the act itself became a kind of worship to Mylitta, and was hallowed through and for her. Thus it came to pass, that every Babylonian woman had once in her life to give herself up to a stranger, and thereby considered her person consecrated to the great goddess. The sacrifice itself seems, especially in the early stage of its introduction among the divine rites of the primitive Babylonians, to have had much less of the repulsiveness, which, in the eyes of highly cultivated nations, must be attached to it; and it was only in later days that it gave rise to the proverbial Babylonian lewdness. Herodotus's account of this subject must, like almost all his other stories, be received with great caution.

MYLIOBATIDÆ. See RAY.

MY'LODON (Gr. grinder-teeth), a genus of huge fossil sloths, whose remains are found in the Pleistocene deposits of South America, associated with the *Megatherium* and other allied genera. A complete skeleton, dug up at Buenos Ayres, measured 11 ft. from the fore part of the skull to the end of the tail. Although like the modern sloth in general structure and dentition, its immense size forbids us to suppose that it could have had the same arboreal habits, and the modifications of its structure seem to have fitted it for the uprooting and prostrating of the trees, the foliage of which supplied it with food.

MY'NIAS, more accurately MINYAS, was, in Greek mythology, the son of Chrysea. He was king of Jolcos, and gave his name to the people called *Minyæ.* He built the city of Orchomenus, where rites (named after him) were selected in his honor. His three daughters, Clymene, Iris, and Alcithoë, according to Ovid, but Leuconoë, Leucippe, and Alcithoë according to other authors, were changed into bats for having contemned the mysteries of Bacchus.

MYNPURI, or **MAINPURI**, a t. of British India, capital of a district in the n.w. provinces, is situated on the banks of a small affluent of the Ganges, 160 m. s.e. of Delhi. It lies at an elevation of 620 ft. above the sea, and is a favorite station for troops, as provisions and water are abundant and good. Mynpuri possesses a Jain temple. The rebels were driven from this place in 1857. Pop. '71, 21,179.

MYOSO'TIS. See FORGET-ME-NOT.

MYOX'IDÆ, a family of rodents commonly known as dormice. From their resemblance to many of the squirrels and marmots they have sometimes been placed in the family *sciuridæ.* The common dormouse, *myaxus avillanarius*, is a well-known hibernating British species. The family are confined to the old world, and contain about 12 species. They have 4 rooted molars on each side of the jaw, a rudimentary thumb, and are destitute of a *cæcum.* See RODENTIA.

MYR'CIA, a genus of trees of the natural order *Myrtaceæ*, to which belongs the Wild Clove or Wild Cinnamon of the West Indies (*myrtaceæ acris*), a handsome tree of 20 or 30 feet high. Its timber is very hard, red and heavy. Its leaves have an aromatic cinnamon-like smell, and an agreeable astringency, and are used in sauces. Its berries are round, and as large as peas, have an aromatic smell and taste, and are used for culinary purposes.

MYR'IAGRAM. See METRIC SYSTEM.

MYRIAM'ETER. See METRIC SYSTEM.

MYRIA'PODA (Gr. myriad-footed), a class of *Articulata*, resembling *Annelida* in their lengthened form, and in the great number of equal, or nearly equal, segments of which the body is composed; but in most of their other characters more nearly agreeing with insects, among which they were ranked by the earlier naturalists, and still are by some. They have a distinct head, but there is no distinction of the other segments, as in insects, into thorax and abdomen. They have simple or compound eyes; a few are destitute of eyes. They have antennæ like those of insects. The mouth is furnished with a complex masticating apparatus, in some resembling that of some insects in a larval state, in others, similar to that of crustaceans. Respiration is carried on through minute pores or spiracles, placed on each side along the entire length of the body, the air being distributed by innumerable ramifying air-tubes to all parts. In most parts of their internal organization the myriapoda resemble insects; although a decided inferiority is exhibited, particularly in the less perfect concentration of the nervous system. The resemblance is greater to insects in their larval than in their perfect state. The body of the myriapoda is protected by a hard *chitinous* covering. The number of segments is various, seldom fewer than 24; although in some of the higher genera they are consolidated together in pairs, so that each pair, unless closely examined, might be considered as one segment bearing two pairs of feet. The legs of some of the lower kinds, as *Julus* (q.v.) are very numerous, and may be regarded as intermediate between the bristle-like appendages which serve many annelids as organs of locomotion, and the distinctly articulated legs of insects. In the higher myriapoda, as *Scolopendra*, the legs are much fewer, and articulated like those of insects. None of the myriapoda have wings. Some of them feed on decaying organic matter, chiefly vegetable; those of higher organization are carnivorous. The myriapoda do not undergo changes so great as those of insects, but emerge from the egg more similar to what they are ultimately to become; although some of them are at first quite destitute of feet; and, contrary to what takes place in insects, the body becomes more elongated as maturity is approached, the number of segments and of feet increasing.

The myriapoda are divided into two orders: the lower, *Chilognatha* (*Julus*, etc.), having the body sub-cylindrical, the feet very numerous, the head rounded, the mandibles thick and strong; the higher *Chilopoda* (*Scolopendra*, etc.), having the body flattened, the feet comparatively few, the head broad, the mandibles sharp and curved.

The myriapoda are found in all parts of the world, in the ground, among moss, under stones, in the decaying bark of trees, in decaying roots, and in many similar situations. The largest species are tropical. They are all generally regarded with aversion. It is doubtful how far any of them are injurious to crops, although it is not improbable that they accelerate rottenness already begun; but some (Centipedes) have a venomous and painful bite.

MYRI'CA. See CANDLEBERRY.

MYRISTICACEÆ. See NUTMEG.

MYRIS'TIC ACID ($C_{28}H_{27}O_3,HO$) is a crystalline fatty acid, found in the seeds of the common nutmeg, *Myristica moschata.* It occurs in the form of a glyceride in the fat of the nutmeg, or nutmeg butter. It has recently been found in small quantity amongst the products of the saponification of spermaceti, and of the fatty matter of milk; and hence this organic acid must be ranked amongst those which are common both to the animal and vegetable kingdoms.

MYRMECO'BIUS, the banded ant-eater of Australia. See MARSUPIALIA.

MYRMECO'PHAGA. See ANT-EATER.

MYRME'LEON. See ANT LION, *ante.*

MYRMID'ONES, an ancient people in Pthiotis, in s. Thessaly. According to the legends, they were so called from Myrmidon, a son of Jupiter, and son-in-law of Æolus. Myrmidon's son, Actor, married Ægina, daughter of Asopus. Another story says they came from Ægina, and were ants (myrmēkes), changed by Jupiter into men. They settled in Thessaly with Peleus, with whose son Achilles, they went to the Trojan war. The name has come to denote, in English, a troop or great horde of ruffians devoted to a single leader.

MYRO'BALANS, the astringent fruit of certain species of *Terminalia*, of the natural order *Combretaceæ*, natives of the mountains of India. The genus *Terminalia* has a deciduous bell-shaped calyx and no corolla; the fruit is a juiceless drupe. *T. Belerica*, a species with alternate eliptical entire leaves, on long stalks, produces great part of the myrobalans of commerce; but the fruits of other species often appear under the same name. Tonic properties are ascribed to myrobalans; but although once in great repute, they are now scarcely used in medicine. They are used, however, by tanners and by dyers, and have therefore become a very considerable article of importation from India. They give a durable yellow color with alum, and, with the addition of iron, an excellent black.—*Emblic myrobalans* are the fruit of *Emblica officinalis*, of the natural order *Euphorbiaceæ*, a native of India. They are used in India as a tonic and astringent; also in tanning and in the making of ink.—There is a kind of plum called the *Myrobalan Plum.* See PLUM.

MY'RON, about B.C. 480—430; native of Bœotia; Athenian sculptor and engraver of wood and silver; studied under Ageladas at Argos. His first great production was the statue of a cow, so wonderfully life-like that it was mistaken for the real animal by cattle. Myron, as Pliny observes, excelled not in expression but in realistic imitation of men and animals. Perhaps his most noted work was the "Discobolus," or quoit-thrower. The bronze image of the cow stood in Athens for many centuries, and was then taken to Rome, where it was known to be as late as the sixth century. Several statues were discovered in the last century, which it was claimed were the work of Myron, and one or two are almost certainly original. The British museum has an ancient marble copy of the "Discobolus."

MYRRH (Heb. *mur*), a gum produced by *balsamodendron* (q.v.) *myrrha*, a tree of the natural order *amyridaceæ*, growing in Arabia, and probably also in Abyssinia. The myrrh tree is small and scrubby, spiny, with whitish-gray bark, thinly-scattered small leaves, consisting of three obovate obtusely toothletted leaflets, and the fruit a smooth brown ovate drupe, somewhat larger than a pea. Myrrh exudes from the bark in oily yellowish drops, which gradually thicken and finally become hard, the color at the same time becoming darker. Myrrh has been known and valued from the most ancient times; it is mentioned as an article of commerce in Gen. xxxvii. 25, and was amongst the presents which Jacob sent to the Egyptian ruler, and amongst those which the wise men from the east brought to the infant Jesus. It was an ingredient in the "holy anointing oil" of the Jews. Myrrh appears in commerce either in tears and grains, or in pieces of irregular form and various sizes, yellow, red, or reddish brown. It is brittle, and has a waxy fracture, often exhibiting whitish veins. Its smell is balsamic, its taste aromatic and bitter. It is used in medicine as a tonic and stimulant, in disorders of the digestive organs, excessive secretions from the mucous membranes, etc., also to cleanse foul ulcers and promote their healing, and as a dentifrice, particularly in a spongy or ulcerated condition of the gums. It was much used by the ancient Egyptians in embalming. The best myrrh is known in commerce as *Turkey myrrh*, being brought from Turkish ports; as the name *East Indian myrrh* is also given to myrrh brought to Europe from the East Indies, although it is not produced there, but comes from Abyssinia. It is not yet certainly known whether the myrrh tree of Abyssinia is the same as that of Arabia, or an allied species.

MYRSINA'CEÆ, a natural order of exogenous plants, consisting of trees and shrubs, natives of warm climates, and having simple leathery leaves, destitute of stipules; hermaphrodite or unisexual flowers, generally small, but often in umbels, corymbs, or panicles; very similar in structure to the flowers of the *primulaceæ;* the fruit generally fleshy, with 1 to 4 seeds. The flowers are very often marked with sunken dots or glandular lines.—There are more than 300 known species. Many of them are beautiful evergreen shrubs, particularly the genus *ardisia*. Some have peppery fruit, as *embelia ribes*.

MYRTA'CEÆ, a natural order of exogenous plants, consisting of trees and shrubs, natives chiefly of warm, but partly also of temperate countries. The order, as defined by the greater number of botanists, includes several suborders, which are regarded by some as distinct orders, particularly Chamælauciaceæ (in which are contained about 50 known species, mostly beautiful little bushes, often with fragrant leaves, natives of New Holland), Barringtoniaceæ (q.v.), and Lecythidaceæ (q.v.). Even as restricted, by the separation of these, the order contains about 1800 known species. The leaves are entire, usually with pelucid dots, and a vein running parallel to and near their margin.—Some of the species are gigantic trees, as the *eucalypti* or *gum tree* of New Holland, and different species of *metrosideros*, of which one is found as far s. as Lord Auckland's islands, in lat. 50½°. The timber is generally compact.—Astringency seems to be rather a prevalent property in the order, and the leaves or other parts of some species are used in medicine as astringents and tonics. A fragrant or pungent volatile oil is often present in considerable quantity, of which *oil of cajeput* and *oil of cloves* are examples. *Cloves* and *pimento* are amongst the best known products of this order. The berries of several species are occasionally used as spices in the same way as the true pimento. A considerable number yield pleasant edible fruits, among which are the Pomegranate, the Guava, species of the genus *Eugenia*, and some species of myrtle.

MYRTLE, *Myrtus*, a genus of *myrtaceæ*, having the limb of the calyx 4 to 5 parted, 4 to 5 petals, numerous free stamens, an almost globose germen, and a 2 to 3 celled berry, crowned with the limb of the calyx, and containing kidney shaped seeds. The leaves are opposite and marked with pelucid dots; the flower-stalks are axillary, and generally one-flowered. The Common Myrtle (*M. communis*) is well known as a beautiful evergreen shrub, or a tree of moderate size, with white flowers. It is a native of all the countries around the Mediterranean sea, and of the temperate parts of Asia, often forming thickets, which sometimes occur even within the reach of the sea-spray. The leaves are ovate or lanceolate, varying much in breadth. They are astringent and aromatic, containing a volatile oil, and were used in medicine by the ancients as a stimulant. The berries are also aromatic, and are used in medicine in Greece and India. A myrtle wine, called *myrtidanum*, is made in Tuscany. Myrtle bark is used for tanning in many parts of the south of Europe. Among the ancient Greeks the myrtle was sacred to Venus, as the symbol of youth and beauty, was much used in festivals, and was, as it still is, often mentioned in poetry. The myrtle endures the winters of Britain only in the mildest situations in the south.—The Small-leaved Myrtle of Peru (*M. microphylla*) has red berries of the size of a pea, of a pleasant flavor and sugary sweetness. Those of the Luma (*M. luma*) are also palatable, and are eaten in Chili; as are those of the Downy Myrtle (*M. tomentosa*), on the Neilgherry hill; and those of the White-berried Myrtle (*M. leucocarpa*), by some regarded as a variety of the common myrtle, in Greece and Syria. The berries of this species or variety are larger than those of the common myrtle, and have a very pleasant taste and smell.—A very humble species of myrtle (*M. nummularia*) spreads over the ground in the Falkland islands, as thyme does in Britain.

MYRTLE-WAX. See Wax.

MY'SIA, in ancient geography, a province in n.w. Asia Minor, joining Lydia on the s. and Bithynia on the e., and bounded w. by the Hellespont and n. by the Propontis; the principal rivers were the Caicus, Æsepus, and Rhyndacus; the surface is mountainous in the interior, and in part table-land. The inhabitants were thought by some ancient writers to be of Thracian, and by others of Lydian descent; probably there were immigrations from both countries. Homer mentions the Mysi, but does not define their country. Mysia was subject to the Lydian monarchy, and under the Persian dominion formed, together with Lydia, one of the satrapies created by Darius. After the death of Alexander the Great, it passed from Macedonian to Syrian rule, was then given to the kings of Pergamus by Rome, and afterwards made a Roman province. Its principal towns were Abydos, Cyzicus, and Pergamus.

MY'SIS, a genus of podophthalmous (stalk-eyed) crustaceans, of the order *stomapoda*, nuch resembling the common shrimps in form, although differing from them in the xternal position of the gills. They are often called *opposum shrimps*, because the last wo feet are furnished with an appendage, which in the female forms a large pouch, nd in this the eggs are received after they leave the ovary, and are retained till the oung acquire a form very similar to that of the parent, when the whole brood are at nce set free into the ocean. Species of mysis are found on the British shores, but they re far more abundant in the Arctic seas, where they form no small part of the food f whales, and of many fishes, particularly of different species of salmon.

MYSORE', or MAISUR, a raji or principality of southern India, under the protection f the British government, in lat. 11° 35' to 15° n., and in long. 74° 45' to 78° 45' east. t is bounded on the n. by the British collectorate of Dharwar, and otherwise surrounded y districts belonging to the Madras presidency. The area is 27,000 sq.m.; the population in 1871–72 was 5,055,412. Mysore is an extensive table-land, with an average elevation of about 2,000 ft., and with a slope principally towards the n. and n.e. The chief ivers are the Cauvery, flowing s.e., and the Tungabhadro, the Hugri, and the Pennar, lowing n. and n.e. The climate of the higher districts is during a great portion of the ear healthy and pleasant. In 1871–72, the value of the exports, which consist of betelnut, cotton, cardamons, rice, silk, and sugar, amounted to £1,100,000. The imports, onsisting mainly of iron, gold, pepper, salt, and pulses, were £1,070,000. Since 1832 he control of the country has been entirely in the hands of the English, and the government is administered by a British commissioner. Chief town, Mysore. For the history f Mysore, see articles HYDER ALI, TIPPOO SAHIB, and INDIA.

MYSORE, or MAISUR, a city of India, the seat of a British residency, capital of the erritory, and of the subdivision of the same name, is situated amid picturesque scenery n a declivity formed by two parallel ranges of elevated ground running n. and s., 245 n. w.s.w. of Madras, lat. 12° 19' n., long. 76° 42' east. The houses are generally built f teak, and among the chief edifices are the British residency and church. The fort is uadrangular in form, three of its sides being 450 yards in length, and the remaining ide longer. The rajah's palace, occupying three sides of the interior fort, contains a nagnificent chair or throne of gold. The climate is mild, but not healthy; fevers are of requent occurrence. Carpets are manufactured. Pop. '72, 57,765.

MYSTAGOGUE (Gr. *mustes*, an initiated person, and *ago*, I lead), the name in the Greek religious system of the priest whose duty it was to direct the preparations of the candidates for initiation in the several mysteries, as well as to conduct the ceremonial of initiation. It was sometimes applied by a sort of analogy to the class of professional *ciceroni*, who in ancient, as still in modern times, undertook to show strangers newly arrived in a city the noteworthy objects which it contained; but the former meaning is its primitive one, and formed the ground of the application of the same name in the Christian church, to the catechists or other clergy who prepared candidates for the Christian *mysteries*, or sacraments, of baptism, of confirmation, and the eucharist, especially the last. In this sense the word is constantly used by the fathers of the 4th and 5th centuries; and in the well-known lectures of St. Cyril of Jerusalem, although all were addressed to candidates for the mysteries, some for baptism, and some for the eucharist, it is only the lectures addressed to the latter that the name *mystagogic* is applied. This distinction was connected with the well-known Discipline of the Secret; and it appears to have ceased with the abolition or gradual disuse of that discipline.

MYSTERIES (Gr. from *muo*, to close the lips or eyes), also called *Teletai*, *Orgia*, or, n Latin, *Initia*, designate certain rites and ceremonies in ancient, chiefly Greek and Roman, religions, only known to, and practiced by, congregations of certain initiated men and women, at appointed seasons, and in strict seclusion. The origin, as well as he real purport of these mysteries, which take no unimportant place among the eligious festivals of the classical period, and which, in their ever-changing nature, designate various places of religious development in the antique world, is all but unknown. It does seem, indeed, as if the vague speculations of modern times on the subject were an echo of the manifold interpretations of the various acts of the mysteries given by the priests to the inquiring disciple—according to the lights of the former or the latter. Some investigators, themselves not entirely free from certain mystic influences (like Creuzer and others), have held them to have been a kind of misty orb around a kernel of pure light, the bright rays of which were too strong for the eyes of the multitude; that, in fact, they hid, under an outward garb of mummery, a certain portion of the real and eternal truth of religion, the knowledge of which had been derived from some primeval, or, perhaps, the Mosaic revelation; if it could not be traced to certain (or uncertain) Egyptian, Indian, or generally eastern sources. To this kind of hazy talk, however (which we only mention because it is still repeated every now and then), the real and thorough investigations begun by Lobeck, and still pursued by many competent scholars in our own day, have, or ought to have, put an end. There cannot be anything more alien to the whole spirit of Greek and Roman antiquity than a hiding of abstract truths and occult wisdom under rights and formulas, songs and dances; and, in fact, the mysteries were anything but exclusive, either with respect to sex, age, or rank, in point of initiation. It was only the speculative tendency of later times, when Polytheism was on the wane, that tried to symbolize and allegorize these obscure, and partly imported ceremonies, the bulk of which had undoubtedly sprung from the midst of the Pelasgian tribes themselves in prehistoric times, and which were intended to represent and to celebrate certain natural phenomena in the visible creation. There is certainly no reason to deny that some more refined minds may, at a very early period, have endeavored to impart a higher sense to these wondrous performances; but these can only be considered as solitary instances. The very fact of their having to be put down in later days as public nuisances in Rome herself, speaks volumes against the occult wisdom inculcated in secret assemblies of men and women.

The mysteries, as such, consisted of purifications, sacrificial offerings, processions, songs, dances, dramatic performances, and the like. The mystic formulas (*Deiknumena*, *Dromena*, *Legomena*, the latter including the Liturgies, etc.) were held deep secrets, and could only be communicated to those who had passed the last stage of preparation in the mystagogue's hand. The hold which the nightly secrecy of these meetings, together with their extraordinary worship, must naturally have taken upon minds more fresh and childlike than our advanced ages can boast of, was increased by all the mechanical contrivances of the effects of light and sound which the priests could command. Mysterious voices were heard singing, whispering, and sighing all around, lights gleamed in manifold colors from above and below, figures appeared and disappeared; the mimic, the tonic, the plastic—all the arts, in fact, were taxed to their very utmost to make these performances (the nearest approach to which, in this country, is furnished by transformation-scenes, or sensation-dramas in general) as attractive and profitable (to the priests) as could be. As far as we have any knowledge of the plots of these mysteries as scenic representations, they generally brought the stories of the special gods or goddesses before the spectator—their births, sufferings, deaths, and resurrections. Many were the outward symbols used, of which such as the Phallus, the Thyrsus, flower baskets, mystic boxes, in connection with special deities, told, more or less, their own tale, although the meanings supplied by later ages, from the Neo-platonists to our own day, are various, and often very amazing. The most important mysteries were, in historical times, those of Eleusis and the Thesmophorian, both representing—each from a different point of view—the rape of Proserpina, and Cere's search for her: the Thesmophorian mysteries being also in a manner connected with the Dionysian worship. There were further, those of Zeus of Crete—derived from a very remote period—of Bacchus himself, of Cybele, and Aphrodite—the two latter with reference to the mystery of propagation, but celebrated in diametrically opposed ways, the former culminating in the self-mutilation of the worshiper, the latter in prostitution. Further, the mysteries of Orpheus, who, in a certain degree, was considered the founder of all mysteries. Nor were the other gods and goddesses forgotten: Hera, Minerva, Diana, Hecate, nay, foreign gods like Mithras (q.v.), and the like, had their due secret solemnities all over the classical soil, and whithersoever Greek (and partly Roman) colonists took their Lares and Penates all over the antique world. The beginning of the reaction in the minds of thinking men, against this mostly gross and degenerated kind of veneration of natural powers and instincts, is marked by the period of the Hesiodic poems; and when, toward the end of the classical periods, the mysteries were no longer secret, but public orgies of the most shameless kind, their days were numbered. The most subtle metaphysicians, allegorize and symbolize as they might, failed in reviving them, and in restoring them to whatever primeval dignity there might have once been inherent in them.

MYSTERIES AND MIRACLE-PLAYS were dramas founded on the historical parts of the Old and New Testaments, and the lives of the saints, performed during the middle ages, first in churches, and afterwards in the streets on fixed or movable stages. Mysteries were properly taken from biblical and miracle-plays from legendary subjects, but this distinction in nomenclature was not always strictly adhered to. We have an extant specimen of the religious play of a date prior to the beginning of the middle ages in the *Christos Paschōn*, assigned, somewhat questionably, to Gregory Nazianzen, and written in 4th c. Greek. Next comes six Latin plays on subjects connected with the lives of the saints, by Roswitha, a nun of Gandersheim, in Saxony, which, though not very artistically constructed, possesses considerable dramatic power and interest; they have been lately published at Paris, with a French translation. The performers were at first the clergy and choristers, afterwards any layman might participate. The earliest recorded performance of a miracle-play took place in England. Matthew Paris relates that Geoffroy, afterwards abbot of St. Albans, while a secular, exhibited at Dunstable the miracle-play of *St. Catherine*, and borrowed copes from St. Albans to dress his characters. This must have been at the end of the 11th or beginning of the 12th century. Fitzstephen, in his *Life of Thomas à Becket*, 1188 A.D., describes with approval the representation in London of the sufferings of the saints and miracles of the confessors. On the establishment of the Corpus Christi festival by Pope Urban IV. in 1264, miracle-plays became one of its adjuncts, and every considerable town had a fraternity for their performance. Throughout the 15th and following centuries, they continued in full force in England, and are mentioned, sometimes approvingly, sometimes disapprovingly, by contemporary writers. Designed at first as a means of religious instruction for the people, they had long before the reformation so far departed from their original character, as to be mixed up in many instances with buffoonery and irreverence, intentional or unintentional, and to be the means of inducing contempt rather than respect for the church and religion. Remarkable collections exist of English mysteries and miracles of the 15th c., known as the Chester, the Coventry, and the Townley plays. The first two have been published by the Shakespeare Society, and the other by the Surtees Society. The Townley mysteries are full of the burlesque element, and contain many curious illustrations of contemporary manners.

Out of the mysteries and miracle-plays sprang a third class of religious plays called *Moralities*, in which allegorical personification of the Virtues and Vices were introduced as *dramatis personæ*. These personages at first only took part in the play along with the scriptural or legendary characters, but afterwards entirely superseded them. The oldest known English compositions of this kind are of the time of Henry VI.; they are mere elaborate and less interesting than the miracle-plays. Moralities continued in fashion till the time of Elizabeth, and were the immediate precursors of the regular drama.

Miracles and mysteries were as popoular in France, Germany, Spain, and Italy as in England. A piece of the kind yet extant, composed in France in the 11th c., is entitled the *Mystery of the Wise and Foolish Virgins*, and written partly in the Provençal dialect and partly in Latin. A celebrated fraternity, called the Confrérie de la Passion, founded in Paris in 1850. had a monopoly for the performance of mysteries and miracle-plays, which were of such a length, that the exhibition of each occupied several days. A large number of French mysteries of the the 14th c. are extant. In the alpine districts of Germany, miracle-plays were composed and acted by the peasants; these peasant-plays had less regularity in their dramatic form, were often interspersed with songs and processions; and in their union of simplicity with high-wrought feeling were most characteristic of a people in whom the religious and dramatic element are both so largely developed. In the early part of the last century, they began to partake to a limited extent of the burlesque, which had brought the miracle-plays into disrepute elsewhere.

It is a mistake to suppose that the hostility of the reformers was what suppressed these exhibitions. The fathers of the reformation showed no unfriendly feeling towards them. Luther is reported to have said that they often did more good and produced more impression than sermons. The most direct encouragement was given to them by the founders of the Swedish Protestant Church, and by the earlier Lutheran bishops, Swedish and Danish. The authorship of one drama of the kind is assigned to Grotius. In England the greatest check they received was from the rise of the secular drama; yet they continued to be occasionally performed in the times of James I. and Charles I., and it is well known that the first sketch of Milton's *Paradise Lost* was a sacred drama, where the opening speech was Satan's Address to the Sun. A degenerate relic of the miracle-play may yet be traced in some remote districts of England, where the story of St. George. the dragon, and Beelzebub, is rudely represented by the peasantry. Strange to say, it was in the Catholic south of Germany, where these miracle-plays and mysteries had preserved most of their old religious character, that the severest blow was levelled against them. Even there, they had begun to be tainted to a limited extent with the burlesque element, which had brought them into disrepute elsewhere. In 1779 a manifesto was issued by the prince-archbishop of Salzburg, condemning them, and prohibiting their performance, on the ground of their ludicrous mixture of the sacred and the profane, the frequent bad acting in the serious parts, the distraction of the lower orders from more edifying modes of instruction, and the scandal arising from the exposure of sacred subjects to the ridicule of freethinkers. This ecclesiastical deununciation was followed by vigorous measures on the part of the civil authorities in Austria and Bavaria. One exception was made to the general suppression. In 1633 the villagers of Oberammergau, in the Bavarian highlands, on the cessation of a plague which desolated the surrounding country, had vowed to perform every tenth year the Passion of Our Savior, out of gratitude, and as a means of religious instruction; a vow which had ever since been regularly observed. The pleading of a deputation of Ammergau peasants with Max. Joseph of Bavaria saved their mystery from the general condemnation, on condition of everything that could offend good taste being expunged. It was then and afterwards somewhat remodelled, and is perhaps the only mystery or miracle-play which has survived to the present day. The last performance took place in 1870. The inhabitants of this secluded village, long noted for their skill in carving in wood and ivory, have a rare union of artistic cultivation with perfect simplicity. Their familiarity with sacred subjects is even beyond what is usual in the alpine part of Germany, and the spectacle seems still to be looked on with feelings much like those with which it was originally conceived. What would elsewhere appear impious, is to the alpine peasants devout and edifying. The personator of Christ considers his part an act of religious worship; he and the other principal performers are said to be selected for their holy life, and consecrated to their work with prayer. The players, about 500 in number, are exclusively the villagers, who, though they have no artistic instruction, except from the parish priest, act their parts with no little dramatic power, and a delicate appreciation of character. The New Testament narrative is strictly adhered to, the only legendary addition to it being the St. Veronica handkerchief. The acts alternate with *tableaux* from the Old Testament and choral odes. Many thousands of the peasantry are attracted by the spectacle from all parts of the Tyrol and Bavaria, among whom the same earnest and devout demeanor prevails as among the performers. Plays of a humbler description, from subjects in legendary or sacred history, are not unfrequently got up by the villagers around Innsbruck, which show a certain rude dramatic talent, though not comparable to what is exhibited at Ammergau. Girls very generally represent both the male and female characters.

MYSTICETE, a name of the whalebone whale, a cetacean of the family *balænidæ*, or toothless whales, see WHALE and CETACEA, *ante*.

MYS'TICISM (Gr. *mustikos*, mystical), a term used with considerable vagueness, but implying that general tendency in religin to higher and more intimate communication with the divine, to which, in most religions, ancient and modern, certain individuals or classes have laid claim. In the Platonic philosophy, and in the eastern systems, from which that philosophy is derived, the human soul being regarded as a portion of the divine nature, it is held to be the great end of life to free the soul from the embarrassment and mental darkness in which it is held by the material trammels of the body in which it is imprisoned. In the pursuit of this end, two very opposite courses were adopted: the first, that of spiritual purification, partly by representing the natural appetites and weakening the sensual impulses by corporeal austerities, partly by elevating the soul through intense contemplation and withdrawal from the outward objects of sense; the other, that of regarding the soul as superior to the body, independent of its animal impulses, incapable, from its higher origin, of being affected by its outward actions, or sullied by contact with the corruption in which its lower nature might love to wallow. A similar element of mysticism, which, in truth, must form in some sense a constituent of every religious system, is traceable in the early doctrinal history of Christianity, and the career of Christian mysticism also divides itself into the same twofold course. Among the early sects external to the church, we trace the first in the system of Tatian and of the Eucratites, while the second finds its parallel in the Syrian gnostics, in Carpocrates, Bardisanes, and in one form at least of the Nicolaitic heresy. Within the Christian church there never [illegible] been wanting a continuous manifestation of the mystical element. The language [illegible] St. Paul in Gal. ii. 20, and in 2d Cor. xii. 2, and many expressions in the Apocalypse, may be taken as the exponents of Christian mysticism, the highest aspiration of which has ever been toward that state in which the Christian "no longer liveth, but Christ liveth in him." And although no regular scheme of mysticism can be found in the early fathers, yet the writings of Hermas the shepherd, the epistles of St. Ignatius, the works of St. Clement of Alexandria, the expositions of Origen, and above all, the confessions of St. Augustine, abound with outpourings of the true spirit of Christian mysticism. It is curious that the first systematic exposition of its principles is said to be in the works of the pseudo-Dionysius the Areopagite; but it was not till the days of the Scholastics that it received its first development, when the mystic life was resolved into its three stages, viz., of purification, of illumination, and of ecstatic union with God and absorption in divine contemplation. It was upon the explanation of this third stage that the great division of the medieval mystic schools mainly turned; some of them explaining the union with God in a pantheistic or semi-pantheistic sense, and thereby annihilating the individual will, and almost the personal action of man in the state of ecstasy; others, with St. Bernard, fully preserving both the individuality and the freedom of man, even in the highest spiritual communication with his Creator. Of the former, many, as the Hesychasts (q.v.) in the Greek church, and the brethren of the free spirit (q.v.) and the Beghards in the Latin, drew from these mystical doctrines the most revolting moral consequences; in others, as Tauler, Ruysbroek, Ekkart, the error does not seem to have gone beyond the sphere of speculation. The writings of Thomas à Kempis (q.v.), of St. Catherine of Siena, of St. John of the cross, and of St. Teresa, may perhaps be taken as the most characteristic representations of the more modern form of the traditionary mysticism which has come down from the mystics of the middle ages.

The later history of mysticism in the Roman Catholic church will be found under the heads of FENELON, MADAME GUYON, MOLINOS, and QUIETISM. The most remarkable followers of the same or kindred doctrines in the Protestant communions are Jacob Böhme (q.v.) of Görlith, Emmanuel Swedenborg (q.v.), and the celebrated William Law (q.v.)

MYTH and **MYTH'OLOGY**. The word *myth* (Gr. *mythos*) originally signified *speech* or *discourse*, and was identical with the word *logos*. After the age of Pindar and Herodotus, however, it came to be synonymous with the Latin word *fabula*, *fable* or *legend*. According to the present use of our language, a myth is an idea or fancy presented in the historical form; and though, of course, any fiction at any time in this shape might be called a myth, yet by usage the word is confined to those fictions made in the early periods of a people's existence, for the purpose of presenting their religious belief, and generally their oldest traditions, in an attractive form. The tendency to create myths in this way seems inherent in every people; certainly there is no people so sunk into the brute as to be without them. A myth is not to be confounded with an allegory; the one being an unconscious act of the public mind at an early stage of society, the other a conscious act of the individual mind at any stage of social progress. The parables of the New Testament are allegorical; so are Æsop's fables; no one mistakes them for realities;

they are known to have been invented for a special didactic purpose, and so received. But the peculiarity of myths is, that they are not only conceived in the narrative form, but generally taken for real narrations by the people to whom they belong, so long as they do not pass a certain stage of intellectual culture. Even myths of which the allegorical significance is pretty plain, such as the well-known Greek myth of Promethus and Epimetheus, were received as facts of early tradition by the Greeks. Myths may be divided into several classes, of which the first and most important is the theological and moral. The oldest theology of all nations is in the form of myths; hence the great importance of mythological study, now universally recognized; for it is not occupied merely or mainly with strange fancies and marvelous fictions, invented for the sake of amusement, but contains the fundamental ideas belonging to the moral and religious nature of man as they have been embodied by the imaginative faculty of the most favored races. It is this dominance of the imagination, so characteristic of the early stages of society, which gives to myth its peculiar dramatic expression, and stamps the popular creed of all nations with the character of a poetry of nature, of man, and of God. From the very nature of the case, the myth-producing faculty exercises itself with exuberance only under the polytheistic form of religion; for there only does a sufficient number of celestial personages exist, whose attributes and actions may be exhibited in a narrative form; there is nothing, however, to prevent even a monotheistic people from exhibiting certain great ideas of their faith in a narrative form, so as by prosaic minds to be taken for literal historical facts. But besides strictly theological myths, there are physical myths, that is, fictions representing the most striking appearances and changes of external nature in the form of political history; in which view, the connection of legends about giants, chimeras, etc., with regions marked by peculiar volcanic phenomena, has been often remarked. It is difficult indeed, in polytheistic religion, to draw any strict line between physical and theological myths; as the divinity of all the operations of nature is the first postulate of polytheism, and every physical phenomenon becomes the manifestation of a god. Again, though it may appear a contradiction, there are historical myths; that is, marvelous legends about persons, who may with probability be supposed to have actually existed. So intermingled, indeed, is fact with fable in early times, that there must always be a kind of debatable land between plain theological myth and recognized historical fact. This land is occupied by what are called the heroic myths; that is, legends about heroes, concerning whom it may often be doubtful whether they are merely a sort of inferior, and more human-like gods, or only men of more than ordinary powers whom the popular imagination has elevated into demi-gods.

The scientific study of mythology commenced with the ancient nations who produced it, specially with the acute and speculative Greeks. The great mass of the Greek people, indeed—of whom we have a characteristic type in the traveler Pausanias—accepted their oldest legends, in the mass, as divine and human facts; but so early as the time of Euripides, or even before his day in the case of the Sicilians, Epicharmus and Empedocles, we find that philosophers and poets had begun to identify Jove with the upper sky, Apollo with the sun, Juno with the nether atmosphere, and so forth; that is, they interpreted their mythology as a theology and poetry of nature. This, indeed, may be regarded as the prevalent view among all the more reflective and philosophical heathens (who were not, like Xenophon, orthodox believers) up from the age of Pericles, 450 B.C., to the establishment of Christianity. But there was an altogether opposite view, which arose at a later period, under less genial circumstances, and exercised no small influence both on Greek and Roman writers. This view was first prominently put forth by Euhemerus, Messenian, in the time of the first Ptolemies, and consisted in the flat prosaic assertion, that the gods, equally with the heroes, were originally men, and all the tales about them only human facts sublimed and elevated by the imagination of pious devotees. This view seemed to derive strong support from the known stories about the birth and death of the gods, specially of Jove in Crete; and the growing skeptical tendencies of the scientific school at Alexandria, were of course favorable to the promulgation of such views. The work of Euhemerus accordingly obtained a wide circulation; and having been translated into Latin, went to nourish that crass form of religious skepticism which was one of the most notable symptoms of the decline of Roman genius at the time of the emperors. Historians, like Diodorus, gladly adopted an interpretation of the popular mythology which promised to swell their stores of reliable material; the myths accordingly were coolly emptied of the poetic soul which inspired them, and the early traditions of the heroic ages were set forth as plain history, with a grave sobriety equally opposed to sound criticism, natural piety, and good taste.

In modern times, the Greek mythology has again formed the basis of much speculation on the character of myths and the general laws of mythical interpretation. The first tendency of modern Christian scholars, following the track long before taken by the fathers, was to refer all Greek mythology to a corruption of Old Testament doctrine and history. Of this system of interpreting myths, we have examples in Vossius, in the learned and fanciful works of Bryant and Faber, and very recently, though with more pious and poetic feeling, in Gladstone. But the Germans, who have taken the lead here, as in other regions of combined research and speculation, have long ago given up this ground as untenable, and have introduced the rational method of interpreting every system of myths, in the first place, according to the peculiar laws traceable in its own genius and growth. Ground was broken in this department by Heyne, whose views have been tested, corrected, and enlarged by a great number of learned, ingenious, and philosophical writers among his own countrymen, specially by Buttmann, Voss, Creuzer, Müller, Welcker, Gerhard, and Preller. The general tendency of the Germans is to start—as Wordsworth does in his *Excursion*, book iv.—from the position of a devout imaginative contemplation of nature, in which the myths originated, and to trace the working out of those ideas, in different places and at different times, with the most critical research, and the most vivid reconstruction. If in this work they have given birth to a large mass of ingenious nonsense and brilliant guess-work, there has not been wanting among them abundance of sober judgment and sound sense to counteract such extravagances. It may be noticed, however, as characteristic of their over speculative intellect, that they have a tendency to bring the sway of theological and physical symbols down into a region of what appears to be plain historical fact; so that Achilles becomes a water-god, Peleus a mud-god, and the whole of the *Iliad*, according to Forchhammer, a poetical geology of Thessaly and the Troad! Going to the opposite extreme from Euhemerus, they have denied the existence even of deified heroes; all the heroes of Greek tradition, according to Uschold, are only degraded gods; and generally in German writers, a preference of transcendental to simple and obvious explanations of myths is noticeable. Creuzer, some of whose views had been anticipated by Blackwell, in Scotland, is especially remarkable for the high ground of religious and philosophical conception on which he has placed the interpretation of myths; and he was also the first who directed attention to the oriental element in Greek mythology—not, indeed, with sufficient discrimination in many cases, but to the great enrichment of mythological material, and the enlargement of philosophical survey. In the most recent times, by uniting the excursive method of Creuzer with the correction supplied by the more critical method of O. Müller and his successors, the science of comparative mythology has been launched into existence; and specially the comparison of the earliest Greek mythology with the sacred legends of the Hindus, has been ably advocated by Max Müller in the *Oxford Essays* (1856). In France, the views of Euhemerus were propounded by Banier (1739). By the British scholars, mythology is a field that has been very scantily cultivated. Besides those already named, Payne Knight, Mackay, Grote in the first volumes of his history, and Keightley are the only names of any note, and their works can in nowise compete in originality, extent of research, in discriminating criticism, or in largeness of view, with the productions of the German school. The best for common purposes is Keightley; the most original. Payne Knight. Recently, G. W. Cox, in a work on Aryan mythology, has pushed the sanscritising tendencies of Max Müller to an extreme which to most minds seems absurd. On the special mythologies of India, Rome, Greece, etc., information will be found under the heads of the respective countries to which they belong. The more important mythological personages are noticed under their own names; see BACCHUS, JUPITER, HERCULES, etc.

MYTILE'NE, or MITYLENE, CITY. See CASTRO, *ante*.

MYTILE'NE, or MITYLENE, ISLAND. See LESBOS, *ante*.

MYTILI'DÆ. See MUSSEL, *ante*.

MYXINE, a genus of cartilaginous fishes, synonomous with the *gastro-branchus* of Bloch, of which the *myxine glutinosa* or glutinous hag is the type. See HAG, *ante*.

MYZONTS. See MYXINOIDS.

N

N, THE fourteenth letter of the English alphabet is one of the nasal liquids of the lingual class. See LETTERS. Its Hebrew (and Phenician) name, *Nun*, signified a *fish*, which its original form was probably meant to represent. N is interchangeable with L (q.v.) and M, as in *col*lect, *com*mingle, *con*fer; and in Ger. *boden*, compared with Eng. *bottom*. In Latin, this letter had a faint, uncertain sound at the end of words and in some other positions, especially before *s*. This accounts for words *on* having lost the *n* in the nominative case, though retaining it in the oblique cases, as *homo, hominis;* and for Greek names like *Platon* being written without the final *n* in Latin. The dull, muffled pronunciation of *n*, which is indicated by such words as *consul, censor, testamento*, being frequently spelled *cosul, cesor, testameto*, was the first stage of the modern French nasal *n*. Before a guttural letter, *n* naturally assumes the sound of *ng*, as *bank*.

NABIS, d. 192 B.C., b. Sparta; usurped the throne of Lacedæmon on the death of king Machanidas, in 207. He put to death the son of the late king Lycurgus, and by threats or torture exacted large sums of money from the rich. He was thus able to raise a considerable army, with which he endeavored to capture the city of Messene. Philopœmen, the commander of the forces of Megalopolis, repulsed him, but the next year Nabis gained the advantage over the Megalopolitans. It seems to have been the design of Nabis to restore the Spartan hegemony in the Peloponnesus, but in 195, he was forced to make peace with the Romans, whose army under Flaminius had besieged Sparta. In 192, being at war with the Achaians, he asked aid from the Ætolians, who furnished him with a small contingent, really for the purpose of destroying him; and their general Alexamenes speedily assassinated him.

NAAS, a market and assize t. of Kildare co., Ireland, 20½ m. s.w. of Dublin, and, next to Athy, the largest town in the county. The population in 1871 was 3,660. The principal street is about half a mile in length; the county court-house is in the main street. Having been anciently the seat of the kings of Leinster, Naas was early occupied by the English. A parliament was held in it in 1419, and it obtained charters successively from Henry V., Elizabeth and James I. At present, Naas is a place of little trade, and is almost entirely without manufactures. It returned two members to the Irish parliament, but was disfranchised at the Union. It is the seat of a diocesan school, and of three national schools, one of which is attached to the Roman Catholic convent. A newspaper, printed at Maryborough, is also published here.

NABLUS. See NABULUS, *ante*.

NA'BOB, or NABAB, a corruption of the word *nawâb* (deputy), was the title belonging to the administrators, under the Mogul empire, of the separate provinces into which the district of a *subahdar* (q.v.) was divided. The title was continued under the British rule, but it gradually came to be applied generally to natives who were men of wealth and consideration. In Europe, and especially in Britain, it is applied derisively to those who, having made great fortunes in the Indies, return to their native country, where they live in oriental splendor.

NABONAS'SAR, ERA OF, was the starting-point of Babylonian chronology, and was adopted by the Greeks of Alexandria, Berosus and others. It began with the accession of Nabonassar to the throne—an event calculated (from certain astronomical phenomena recorded by Ptolemy) to have taken place Feb. 26, 747 B.C.

NABULUS', or NABLUS' (a corruption of the Gr. *Neapolis*, New City, the name given to it in the reign of Vespasian), anciently called SHECHEM or SICHEN, in the New Testament (John iv. 5), SYCHAR; is a t. of Palestine, possessing, it is said, "the only beautiful site from Dan to Beersheba." It lies between mount Ebal and mount Gerizim, on the s. side of the valley of Erd-Mûkhna, and has a population variously estimated at from 8,000 to 14,000 of whom about 500 are Christians, 150 Samaritans, and 50 Jews; the rest are Mohammedans, fierce, turbulent, and fanatical. The houses are pretty good, but the streets (as usual in the East) are narrow, gloomy, and filthy. The chief productions are soap, cotton, and oil—the soap manufactories are large, and the oil is considered the best in Syria.—See Porter's *Handbook for Syria and Palestine*, and Stanley's *Palestine*.

NACHTIGAL, GUSTAV, b. Germany, 1834; studied medicine, which he practiced in Algeria, 1859–63. He then became a physician in the military service of the bey of Tunis, who soon made him his private medical adviser. In 1869 he started for Kuka, joining a caravan which was dispatched to carry from the king of Prussia to the sheikh of Borndo, some gifts in recognition of his services to various German explorers. After a journey in the Tiboo country, he set out for Kuka, where he arrived in 1870. He made a thorough exploration of Bornoo, from which he went on several exploring expeditions. He went to lake Tchad, and collected a large store of materials in regard to the geography of the s. districts of Sahara. Making his way to Baghirmi, he followed up the Shai river and its tributaries. In the spring of 1878, he set out for Egypt, going s. of lake Tchad, through Waday which he was the first European to penetrate. He visited Abeshr, the capital of Waday, passed through the kingdom of Darfoor, and arrived at Cairo, Nov., 1874. An account of his explorations is given in his *Die Tributären Heidenländer Baghirmis*, published in 1874.

NACOGDO'CHES, a co. in e. Texas, bounded on the e. by Attoyac river, and on the s.w. by the Angelina river; 900 sq.m.; pop. '80, 11,592–11,511 American birth, 3,040 colored. The surface is undulating and hilly, and much of it covered with a thick growth of forests. The soil is generally fertile, and particularly adapted to raising corn and cotton. Other productions are sweet potatoes, barley, and sorghum molasses. Co. seat, Nacogdoches.

NACRE. See MOTHER OF PEARL.

NA'DAL, BERNHARD H., D.D., LL.D., 1812–70; b. Maryland; admitted as a preacher in the Methodist Episcopal church by the old Baltimore conference in 1835. He was the pastor of 15 churches in different states n. and south. While a pastor he was a diligent student, and when stationed at Carlisle in 1848 he graduated at Dickenson college, pursuing his studies in connection with his pastoral work. He also taught a class in college. In 1849 he supplied the pulpit of an Independent church in Baltimore. In 1854–57 he was professor in the Indiana Asbury university. In 1857, returning to the Baltimore conference, he was made presiding elder of the Roanoke district in Virginia. During the slavery agitation at this time he vigorously defended his church and conference. In sermons and addresses he earnestly espoused and aided the cause of the national government in the war of the rebellion, and enjoyed the friendship of president Lincoln. In 1869 he became professor of historical theology in Drew seminary at Madison, N. J., and after the death of Dr. McClintock was acting president, but was soon removed by death. He was an able preacher, a vigorous and polished writer, and contributed largely to periodicals. He was one of the editors of the *Methodist*, of whom Dr. Crooks said that "in writing he was almost without a peer in the American Methodist church." He was a thorough scholar and highly esteemed as an instructor.

NA'DIR, an Arabic word signifying that point in the heavens which is diametrically opposite to the zenith, so that the zenith, nadir, and center of the earth are in one straight line. The zenith and nadir form the poles of the horizon (q.v.). See ZENITH.

NADIR SHAH, of Persia, belonged to the Afshars, a Turkish tribe, and was born near Kelat, in the center of Khorassan, Persia, in 1688. When 17 years old, he was taken prisoner by the Usbeks, but escaped after four years of captivity; entered the service of the governor of Khorassan, and soon obtained high promotion. Having, however, been degraded and punished for some real or supposed offense, he betook himself to a lawless life, and for several years was the daring leader of a band of 3,000 robbers, who levied contributions from almost the whole of Khorassan. An opportunity having occurred, Nadir seized the town of Kelat, and gradually extended his territorial authority. Persia was at this time ruled by Melek Ashraf, an Afghan of the tribe of Ghilji, whose grinding tyranny and cruelty produced in the mind of every Persian a deadly hatred of the very name Afghan, which exists to the present day. Nadir having avowed his intention of expelling the hated race from the country, and restoring the Suffavean dynasty, numbers flocked to his standard, and Meshed, Herat, and all Khorassan were speedily reduced. Ashraf, signally defeated in several engagements, fled before the avenger, who, with a celerity only equaled by its thoroughness, purged the provinces of Irak, Fars, and Kerman of even the semblance of Afghan domination. The assassination of Ashraf, during his retreat, terminated the war. The rightful heir, Tamasp, then ascended the throne, and Nadir received for his services the government of the provinces of Khorassan, Mazanderan, Seistan, and Kerman, assuming at the same time the title of Tamasp-kûli (the slave of Tamasp), the title of khan being subsequently added. He was sent against the Turks in 1731, and defeated them at Hamadan, regaining the Armenian provinces which had been seized by the Turks in the preceding reign; but his sovereign having in his absence engaged unsuccessfully the same enemy, Nadir caused him to be put in prison, and elevated his infant son, Abbas III., to the throne in 1732. The death of this puppet, in 1736, opened the way for the elevation of Nadir himself, who was crowned as Nadir shah, Feb. 26, 1736. He resumed the war with the Turks; and though totally defeated in the first two battles by the grand vizier Asman, turned the tide of fortune in the subsequent campaign, and granted peace to the Turks on condition of receiving Georgia. He also conquered Afghanistan, and drove back the invading Usbeks. His ambassador to the Great Mogul having been murdered along with his suite at Jelalabad, and satisfaction having been refused, Nadir, in revenge, ravaged the Northwest Provinces, and took Delhi, which he was, by the insane behavior of the inhabitants, reduced to the necessity of pillaging. With booty to the amount of £30,000,000, including the Koh-i-nûr (q.v.) diamond, he returned to the w. bank of the Indus. He next reduced Bokhara and Khaurezm, restoring to Persia her limits under the golden reign of the Sassanides. From this period, his character underwent a sudden change; he was formerly open-hearted, liberal, and tolerant; he now became suspicious, avaricious, and tyrannical. The empire groaned under his extortions, and he was finally assassinated on June 20, 1747. His only surviving son was carried to Constantinople, and thence to Vienna, where he was brought up as a Catholic under the surveillance of the empress Maria Theresa, and died a maj. in the Austrian service, under the title of baron Semlin. Nadir's tyranny has now been forgotten; and at the present day he is regarded with pride and gratitude as the "Wallace" of Persia.

NÆ'VIUS, CN., one of the earliest Latin poets, was born, probably in Campania, in the first half of the 3d c. B.C. In his youth, he served in the first Punic war; but about the year 235 B.C., he made his appearance at Rome as a dramatic writer. Of his life, we know little; but of his character, rather more. He was very decidedly attached to the plebeian party; and in his plays, satirized and lampooned the Roman nobles with all the virulence and indiscretion of a hot-blooded impetuous Campanian—that Gascon of ancient Italy! His rashness ultimately caused his banishment to Utica in Africa, where he died, 204 or 202 B.C. Besides his dramatic writings, comprising both tragedies and comedies, he wrote an epic poem, *De Bello Punico*, in the old Saturnian meter. Of these, only a few very unimportant fragments are extant, which may be found in Bothe's *Poetarum Latinorum Scenicorum Fragmenta* (Halberstadt, 1824), or Klunmann's collection of the same (Jena, 1843), enriched by a life of Nævius, and an essay on his poetry. See also Sellas's *Poets of the Roman Republic* (Edin. 1863).

NÆ'VUS (known popularly as *mother-spot* or mole) is a congenital mark or growth on a part of the skin. Sometimes it is merely a dark discoloration of the surface as described in the article MACULÆ, in which case it is termed a mole and is perfectly harmless; but often it consists of a dense net-work of dilated blood-vessels, forming a reddish or livid tumor, more or less elevated above the surface of the surrounding skin. The most frequent situations of these vascular nævi are the skin and subcutaneous cellular tissue of the head; but they may occur elsewhere. The popular belief is, that they are caused by the longing of the mother during her pregnancy for a lobster, or strawberry, or raspberry, or some other red-colored article of food, and that the influence of her mind has impressed upon the fetus a more or less vivid image of the thing she longed for; and hence the name of *mother-spot.* Sometimes these tumors waste away spontaneously, and give no trouble; but frequently they increase rapidly, invade the adjacent tissues, and ulcerate or slough, and thus become dangerous to life by hemorrhage. When these tumors do not show a tendency to increase, no treatment is necessary. When they are obviously increasing in size, the continual application of cold (by means of freezing mixtures), with moderately firm pressure, is sometimes of service; but a more certain method is to employ means to produce such an amount of inflammation as to obliterate the vessels; for this purpose, the seton, the application of nitric acid, and vaccination of the tumor, have been successfully applied. The injection of strong astringents, with the view of coagulating the blood, has sometimes effected a cure. If all these means fail, extirpation, either with the ligature or knife, must be resorted to; the ligature being regarded as the safest and best method. For the various methods of applying the ligature, the reader is referred to any standard work on operative surgery. If the tumor is in an inaccessible spot, as in the orbit of the eye, and is increasing rapidly, the only course is to tie the large vascular trunk supplying it. The common carotid artery has in several instances been tied with success for vascular nævus in the orbit.

NÄ'FELS, a village of Switzerland, in the canton of Glarus, and 5 m. n. of the town of that name, in a deep valley, is one of the most famous battle-fields in the country. Pop. '70, 2,490. Here, in 1388, 1500 men of Glarus, under Matthias am Buhl, overthrew an Austrian force of from 6,000 to 8,000 men. The event is still celebrated yearly.

NA'FTIA, LAGO, a curious small lake in Sicily, about two miles from Mineo, in Catania. It is situated in a plain, amidst craggy hills, and is of a circular form, commonly sixty or seventy yards in diameter, and about fifteen feet deep, but in dry weather shrinking to a much smaller size, and being occasionally altogether dried up. In the midst of it are three small craters, two of which perpetually send up water in jets to the height of two or three feet; the third is more intermittent. The water is greenish, or turbid, and has an odor of bitumen. The whole lake resembles a boiling caldron, from the escape of carbonic acid gas, rushing upwards with great force. The atmosphere is consequently fatal to birds attempting to fly across the surface of the lake, and to small animals which approach it to satisfy their thirst; and an approach to it is attended with headache and other painful circumstances to man himself. The ancients regarded these phenomena with great dread. They supposed that Pluto, when carrying off Proserpine, drove his fiery steeds through this lake, ere his descent to the lower regions. A temple was erected here to the gods of the two craters, the *Dii Palici,* who were supposed to be twin sons of Jupiter by the nymph Thalia. Pilgrims flocked to this shrine; and it afforded an inviolable asylum to slaves who had fled from their masters. An oath by the Dii Palici was never broken by the master, who found himself compelled here to come to terms with his runaway slave. No remains of the temple of the Dii Palici are left, although it is described as having been magnificent.

NAGA is, in Hindu Mythology, the name of deified serpents, which are represented as the sons of the Muni Kas'yapa and his wife Kadrû, whence they are also called Kadraveyas. Their king is S'esha, the sacred serpent of Vishn'u.

NAGAPATA'M, a seaport of British India, on the Coromandel coast, in the province of Tanjur, 15 m. south of Karikal. It was taken by the Dutch in 1660, but fell into the hands of the English in 1781. Its site is an open sandy plain, elevated only three or four feet abova sea-level. The port is visited by small vessels, and carries on some trade with Ceylon. Pop. at the census of 1871, 48,525.

NAGARJUNA, or NAGASENA, is the name of one of the most celebrated Buddhistic teachers or patriarchs—the thirteenth—who, according to some, lived about 400 years, according to others, about 500 years, after the death of the Buddha S'âkyamuni (i. e., 143 or 43 B.C.). He was the founder of the Mâdhyamika school, and his principal disciples were Aryadeva and Budhapâlita. According to the tradition of the Buddhas, he was born in the south of India, in a Brahmanical family. Even as a child, he studied all the four Vedas; later, he traveled through various countries, and became proficient in astronomy, geography, and magical arts. By means of the last, he had several amorous adventures, which ended in the death of three companions of his, but in his own repentance, and, with the assistance of a Buddhist mendicant, in his conversion to Buddhism. Many miracles are, of course, attributed to his career as propagator of this doctrine, especially in the south of India, and his life is said to have lasted 800 years.—See E. Burnouf, *Introduction à l'Histoire du Buddhisme Indien* (Paris, 1844); Spence Hardy, *A Manual of Buddhism* (Lond. 1853); W. Wassiljew, *Der Buddhismus, seine Dogmen, Geschichte und Literatur* (St. Petersburg, 1860).

NAGASA'KI, or NANGASIKI, a city and port of Japan, opened to foreign commerce by the treaty of 1858, on July 1, 1859, is situated in 32° 44′ n. lat., and 129° 51′ e. long., on the western side of a peninsula in the n. w. of the island of Kiusiu. Previously to 1859, it was the only port in Japan open to foreigners. The harbor, which is one of the most beautiful in the world, is about six miles in width, and three or four in length. To a person inside, it appears completely land-locked, and it is surrounded by hills of about 1500 ft. in height. These are broken into long ridges and deep valleys; while the more fertile spots are terraced and under cultivation. The town of Nagasaki, which is about a mile in length, and three-quarters of a mile in width, lies on the n. side of the bay; its pop. is estimated at 70,000. The streets in general are clean and well-paved, but the houses are not particularly good, except those possessed by courtesans, and known as "tea-houses." On the hills behind the town are various temples, those dedicated to "Sinto," or the worship of the sun goddess, which is the old national religion of Japan, and those in which the Buddhistic worship, imported from China, is followed. The foreign settlement lies to the s. of the native town, the British, French, German, Prussian, and Portuguese consulates occupying the hilly ground back from the bay. On the opposite side of the bay, the Japanese have a steam-factory, under the direction of Dutch officers, and close by is the Russian settlement. The climate of Nagasaki is genial but variable. The trade of Nagasaki is inferior to that of Kanagawa. Sea-weed, salt-fish, and other articles are exported to China. The exports to Europe are mainly tea, tobacco, coal, ginseng, vegetable wax, and copper. The chief imports are cotton piece-goods, woolen goods, sugar, oils. The total value of imports in 1875 amounted to $1,617,000, and of the exports to close on $2,000,000. The import trade suffers from the absence of wealthy native merchants and of banking facilities. In 1879 the great new dock of Nagasaki, the largest in Japan, was in use. It is 460 ft. long by 89 broad, and 28 deep, and is expected to promote trade.

NA'GELFLUE, the provincial name for a bed of conglomerate belonging to the Mollasse (q. v.), which forms a considerable portion of the strata in the central region of Switzerland, between the Alps and the Jura. It is said to attain the enormous thickness of 6,000 and 8,000 ft. in the Rhigi near Lucerne, and in the Speer near Wesen.

NAGKESUR, the name under which the blossoms of the *Mesua ferrea* are sold in the bazaars of India. See GUTTIFERÆ.

NAGO'YA, a city in Japan, in the province of Owari, a few miles n. of the head of Owari bay, the seat of the Aichi ken, or prefecture, pop. 150,000. The city is regularly laid out, and the castle, built in 1610, is one of the finest among the feudal strongholds still standing intact. Two of its towers were long ornamented by huge images of rampant fish made of copper, covered with plates of solid gold. The great high road called the Tokgido, passes through the city, which has a bustling trade carried on with pack-horses and long narrow carts. Junks and steamers enter and clear at Miya, the sea port, a few miles southward. In the numerous factories in the city, porcelain, faience, cloison-ware, fans, carvings, and lacque work, are made chiefly for export. The art of enameling on porcelain in cloisons of metal threads originated here in 1872.

NAGPUR', an extensive inland province of British India, is under the chief commissioner of the Central Provinces. Its area is 22,343 sq. m., and its pop. in 1872 was 2,280,081; but this designation has been used to include a much greater area. The n part of the province is mountainous in character, being traversed by spurs of the great Vindhya range; the general slope of the surface is from n. w. to s. e, and the bay of Bengal receives the drainage of the country chiefly through the rivers Máhandí and Wain Gangá—the latter a tributary of the Godávari. The climate is not healthy, and is especially insalubrious in the extensive tracts of low marshy land which abound in the province. The Gonds (see INDIA), supposed to be the aborigines, are the most remarkable class of the inhabitants. They rear fowls, swine, and buffaloes; but their country, forming the south-eastern tracts—about one-third of the whole—is covered with a dense jungle, swarming with tigers. In the more favored districts, where the inhabitants are more industrious, rice, maize, oil, and other seeds, and vegetables are extensively cultivated. The rajahs of Nagpur, sometimes called the rajahs of Berar, ruled over a state formed out of a part of the great Mahratta kingdom. The dynasty, however, died out in 1853, and the territory came into possession of the British. The province has five divisions—cap., Nagpur.

NAGPU'R', a city of British India, capital of the province of the same name, and situated near its n. w. extremity, in an unhealthy swampy hollow, 430 m. in a direct line e. n. e. of Bombay. Inclusive of its extensive suburbs, it is seven m. in circumference It contains no important edifices. The great body of the inhabitants live in thatched mud-tents, interspersed with trees, which prevent the circulation of air, and secrete moisture, thus rendering the town unnecessarily unhealthy. The mean temperature of Nagpur is estimated at about 80° F. Cotton cloths, coarse and fine chintzes, turbans, silks, brocades, blankets, woolens, tent-cloths, and articles in copper and brass are manufactured. Here, on Nov. 26 and 27, 1817, a small British force of 1350 men, commanded by col. Scott, defeated a native army of 18,000 men. Pop. '72, 84,441.

NAG'S HEAD CONSECRATION. This story, which was first circulated by the Roman Catholics forty years after the event, with respect to archbishop Parker's consecration, was to the following effect. On the passing of the first Act of Uniformity in the first year of queen Elizabeth, fourteen bishops vacated their sees, and all the other sees excepting that of Llandaff being vacant, there was difficulty in maintaining the hitherto unbroken succession of bishops from apostolical times. Kitchin of Llandaff refused to officiate at Parker's consecration, and consequently the Protestant divines procured the help of Scory, a deprived bishop of the reign of Edward VI., and all having met at the Nag's Head tavern in Cheapside, they knelt before Scory, who laid a Bible on their heads or shoulders, saying: "Take thou authority to preach the word of God sincerely;" and they rose up bishops of the new church ot England ! The story is discredited by the Roman Catholic historian Lingard, and is carefully refuted by Strype in his life of Parker. The facts of the case are, that the election took place in the chapter-house at Canterbury, the confirmation at St. Mary-le-Bow's church in Cheapside, and the consecration in the chapel of Lambeth palace. Scory, then elected to the see of Hereford; Barlow, formerly bishop of Wells, then elected to Chichester; Coverdale, formerly of Exeter, and never reappointed to any see; and Hodgkin, suffragan of Hereford, officiated at the consecration. The Nag's Head story probably arose from the company having possibly gone from Bow church, after the confirmation, to take a dinner together at the tavern hard by, according to the prevailing custom. The due succession of bishops in the English church has never been broken.

NAGY, a Hungarian word, meaning "great." It is prefixed to the names of many towns in Hungary and Transylvania. In the present work, many of the towns that take this prefix are given under the name that comes after it.

NAGY ENYE'D, a small town of Transylvania, on the Maros, 17 m. n. n. e. of Karlsburg. It contains a famous Calvinistic college. Pop. '69, 5,779.

NA'GY KARO'LY (i. e., Great Karóly), a town of Hungary, capital of the county Szathmar, 37 m. e. n. e. from Debreczin, on a small feeder of the Theiss. It has several important annual fairs, and a trade in corn and cattle. Pop. '69, 12,754.

NAGY KÖRÖS. See Körös, *ante*.

NAGY—SZEBEN. See HERMANNSTADT, *ante*.

NAGY—VARAD. See GROSSWARDEIN, *ante*.

NAHANT, a t. in Essex co., Mass., situated on a peninsula which extends into Massachusetts bay from the township of Lynn, 9 m. s. of Salem, and 14 m. n. e. from Boston. It is divided into Great Nahant, Little Nahant, and Bass Neck. An isthmus leading from the main land to little Nahant is a mile and a half long and very narrow. Then comes a beach 90 rods long connecting Great Nahant, which contains 463 acres of land. In many places the shores are lined with rocks, rising 20 or 60 ft. above the tide, and the beaches are very hard and smooth. It has been a popular resort for citizens of Boston and vicinity for 30 or 40 years, and here and there along the peninsula are many handsome cottages, among which are those of Longfellow, the poet, and the late prof. Agassiz. There are also in the town three small hotels, two churches, and two schools. Pop. (1870) 475.

NA'HUM, one of the twelve minor prophets, was a native either of Elkosh, in Galilee, or the son of a man named Elkosh. The identification of his birthplace with Capernaum (Nahum's village) or a place called Elkosh, on the east side of the Tigris, not far from Nineveh, is the result of vague speculation. He was probably a contemporary of Isaiah, and flourished about 713–711 B.C. The burden of his "vision" (in chap. 3) is the destruction of Nineveh and the downfall of the Assyrian kingdom. His style is full of animation, fancy, and originality, and at the same time clear and rounded. His language throughout is classical, and in the purest Hebrew, belonging to the second half of Hezekiah's reign, or to the time immediately following the defeat of Sennacherib before Jerusalem (2 Kings xix, 35, etc.). A commentary on Nahum, with special reference to the Assyrian monuments lately discovered, has been written by O. Strauss (Berlin, 1853).

NAHUM, BOOK OF (*ante*), has an undoubted place in the canon of Jewish scripture. The precise time at which it was written has not been determined, notwithstanding the diligent investigation of the question that many writers have made. Resemblances are pointed out between it and other prophecies, the most striking being ii., 10, compared with Joel ii., 6; and i., 15, almost identical with Isaiah lii., 7. While these passages show quotation, they do not decide priority. An indication of time is furnished by references which Nahum makes to the subjection of the Jews to the king of Nineveh, from whom the Lord would soon deliver them. "Now will I break his yoke from off thee, and will burst thy bonds in sunder." This prediction applies well to Sennacherib's signal destruction in the reign of Hezekiah, and is thought to indicate that Nahum was contemporary with Isaiah and Micah.

The prophecy is called the burden of Nineveh, the appointed destruction of which, with the resulting consolation to Judah, is the one subject treated of. Chapter i. contains a sublime description of the majesty, retributive justice, power and goodness of God in his government over men; denounces the violence of wicked men against his people as transgression against himself; declares his purpose speedily to break the yoke of the oppressors, and exhibits the messenger of glad tidings going forth to summon the Jews back to the temple and their homes. Chapter ii. foretells with the particularity of history the destruction of Nineveh, announcing the invaders bold approach, calling upon the Assyrians to put forth their utmost strength against him; describing the bloody shields of his warriors, their splendid attire, their chariots, flashing like lightning through the streets; their warriors breaking ranks in their haste to reach the wall, the opening of the river gates, the undermining of the palaces, the flight of the inhabitants, and the reduction of the city to an empty desert. Chapter iii. arraigns Nineveh as a city of blood and abominable crime, because of which the Lord of hosts would heap ruin and desolation upon it; calling on it to read its own doom in the fate of No-Amon, the Thebes of secular history; declaring that its drunkenness would be the occasion of its ruin, that its strongholds would yield as easily as ripe figs fall when the tree is shaken, that its warriors would be cowards, that its gates would be set open, and all obstructions to the advance of the invaders burned down; and that its multitude of rich merchants and crowned warriors would be like the locusts that darken the land one day, but flee away the next, so that the very place where they had been is not known. The particulars of the prophecy have been definitely fulfilled. 1. As to the last specified, "Their place is not known where they were." All books written more than 40 years ago, that refer to Nineveh, speak of its exact location as unknown. Murray's *Encyclopædia of Geography*, the American edition of which was published in 1840—the year in which Layard first saw the mounds that he afterwards explored—gives what was then the general belief of the civilized world: "The village of Nunia on the Tigris appears to occupy a part of the vast circuit of ancient Nineveh. The only monuments are mounds of earth, similar to those of Babylon, but not nearly so lofty or so perfect. A rampart may still be traced some miles in circumference, surrounded with a fosse and covered with grass." In the most ancient historians there is great confusion, and even contradiction. Herodotus, "the father of history," in one place says it was on the Euphrates, and in another, on the Tigris. The Romans contended with the Persians on its site, from which even ruins had in a great degree disappeared; in 330 B.C. Alexander fought his last decisive battle with Darius on the same plain, without knowing that it had been a renowned seat of grandeur and power; and more than a century earlier still Xenophon and the Greeks passed there the ruins of large deserted cities, which, he says, had in ancient times been inhabited by the Medes. 2. Nahum prophesied that the city should be plundered of all its treasures. When the Arab workmen were cutting open the mounds under Layard's direction, they searched eagerly for the treasures which they believed had been hidden there, and which have been found in the ruins of other ancient cities. But they found only a few fragments of gilding, which had fallen from some of the inscriptions; the explorers uncovered it just as the conqueror had left it. 3. Nahum predicted that easy access would be obtained by the invaders to some portions of the city, but that wherever the inhabitants should resort to their strongholds, these should be subjected to the flames. And from the monuments it plainly appears that while some portions of the city were destroyed by fire, other portions escaped the flames. The n.w. palace at Nimroud had not been burned, but in the s.w. corner many of the alabaster slabs, having been reduced to lime by subjection to intense heat, fell to pieces as soon as they were uncovered. In many parts great accumulations of charcoal were found. Some of the large sculptures were cracked into a thousand pieces. When the ruins of Sennacherib's imposing palace were discovered, it was perceived that a great fire had raged through it, turning the sculptured paneling into lime, and reducing the edifice to a heap of ashes and rubbish.

NA'IA. See ASP and COBRA.

NA'IADES, NAIADA'CEÆ, or **POTAMEŒ,** a natural order of endogenous plants, divided by some botanists into several orders (*juncagineæ, zosteraceæ,* etc.), containing in all not quite 100 known species, all aquatic plants, some of them inhabiting the ocean, some found in lakes and ponds, some in streams. They are all of very cellular structure; the leaves have parallel veins, and the flowers are inconspicuous. To this order belongs the pondweed (*potamogeton*), of which a number of species abound in the still waters of Britain, and of which some are found as far n. as Iceland. To this order also belongs the GRASSWRACK (q.v.) of our shores, used for stuffing mattresses. The lattice-leaf (q.v.) of Madagascar is one of the most interesting species, and one of the few which attract notice as in any way beautiful.

NA'IADS, in Grecian mythology, the nymphs of fresh-water lakes, rivers, and fountains. They were believed to possess the power of inspiration; hence, soothsayers and others are sometimes called *nympholeptoi* (seized by the nymph). They were represented as half-clothed maidens, and not unfrequently as companions of Pan, of Hercules, the patron of warm springs, or of the Sileni and the Satyrs, in whose jovial dances they join.

NA'IANT, or **NA'TANT** (Lat. *natare,* to swim), a heraldic term applied to a fish when borne horizontally across the shield in a swimming position.

NAIGUE, or **NAIK,** a native subaltern officer among Indian and Anglo-Asiatic troops, whose functions are somewhat analogous to those performed among European troops by the drill-sergeant.

NAILS are flattened, elastic, horny plates, which are placed as protective coverings on the dorsal surface of the terminal phalanges of the fingers and toes. Each nail consists of a *root,* or part concealed within a fold of the skin; a *body,* or exposed part attached to the surface of the skin; and a free anterior extremity called the *edge*. The skin below the root and body of the nail is termed the *matrix*, from its being the part from which the nail is produced. This is thick, and covered with highly vascular papillæ, and its color is seen through the transparent horny tissue. Near the root the papillæ are smaller and less vascular; hence the portion of nail corresponding to this part is of a whiter color; from its form, this portion is termed the *lunula*. It is by the successive growth of new cells at the root and under the body of the nail that it advances forwards, and maintains a due thickness, whilst at the same time its growth in a proper direction is insured. The chemical composition of the nails is given in the article HORNY TISSUES, to which class of structures they belong. According to the observation of Beau, the finger-nails grow at the rate of about two-fifths of a line in a week, while the toe-nails only grow with about one-fourth of that rapidity. When a nail has been removed by violence, or has been thrown off in consequence of the formation of matter (pus) beneath it, a new nail is speedily formed, provided the matrix has not been seriously injured.

There is a very common and troublesome affection popularly known as *ingrowing nail.* Its most usual seat is by the side of the great toe. It does not in reality arise from any alteration of the nail, but from the adjacent soft parts being constantly pressed by the use of tight shoes against its edge. These parts become swollen and inflamed; suppuration ensues, and an intensely sensitive ulcer is formed, in which the nail is embedded. Surgical advice should at once be resorted to in these cases, as there is no probability that the ulcer will heal spontaneously, especially if the patient continue to move about, and thus keep up irritation. In obstinate cases, it is not unfrequently necessary to remove a portion of the nail, an operation attended with much pain, although quickly performed.

NAILS, pointed pieces of metal, usually with flattened or rounded heads, used for driving into wood-work, for the purpose of holding the pieces together. A variety, in which the head is very large, and the spike portion small, used by shoemakers for protecting the soles of boots and shoes from wear, is called the *hob-nail;* another, which is made by cutting thin plate-iron into thin pointed pieces of various lengths, is called *brads;* these sometimes are without heads, but are usually made with a slight projection by way of a head. When made small, with flat heads, for attaching cloth or hangings in upholstery-work, they are called *tacks;* and when very large for heavy carpentry, *spikes.*

Nail-making.—Formerly, all nails were hand-made, by forging on an anvil; and in Britain and the north of Europe vast quantities are still made in this manner, being preferable, for many kinds of carpenters' work, to those made by machinery. In France, the greater part of the nails used for light carpentery-work are made of soft iron wire, pointed with the hammer; and in order to head them they are pinched in a toothed vice, which leaves the portion for the head projecting, and makes below it three or four grooves in the nail, which increase its hold on the wood when driven home. The head is beaten into a counter-sinking on the vice, which regulates the size.

The iron used for hand nail-making in Britain is sold in bundles, and is called *nail-rods;* it is either prepared by rolling the malleable iron into rods or small bars of the required thickness—which process is only employed for very fine qualities—or by cutting plate-iron into strips by means of rolling-shears; these shears consist of two powerful revolving shafts, upon which are fixed discs of hard steel with squared edges. The discs of one shaft alternate with those of the other; they are of the thickness of the plate to be cut, and the shafts are so placed that a small portion of one set of the discs are inserted between those of the other set. When the shafts are revolving a plate of iron is pressed between the discs; and it is forcibly drawn through, the steel discs cutting the plates into strips with great rapidity. The quantity produced in this way is enormous, some mills turning out at the rate of ten miles per hour of nail-rods.

Several inventions, in which America took the lead, have been introduced, and are successfully worked, for making nails direct from plate-iron, either by cutting them out cold or hot; and a very large proportion of the nails in use are made in this way. Nail-making by machinery was originated in Massachusetts in 1810.

NAILS (*ante*). The whole enormous industry of nail-making in this country, except for wall-nails and shoe-nails, which are cast, and sprigs, headless brads, etc., which are cut out of the plate, involves various machines for cutting and heading. Nearly two dozen patents for improvements in these machines had been granted here by the beginning of the century. The ore, whether hematite or magnetic, is smelted in a blast-furnace, run into pigs, puddled, squeezed, and, if need be, hammered, rolled in the puddling-ball train, and cut to lengths. These are then fagotted, that is, piled so as to break joints, reheated to a white heat, drawn, passed through the nail-plate train, and the sheets, of the required width and thickness, allowed to cool. It is next cut across its length (the width of the sheet being usually about a foot) into strips which are a little wider than the length of the required nail. These plates, heated by being set on edge on hot coals, are seized in a clamp and fed to the machine, end first. The pieces cut out are alternate, and slightly tapering, of course, with the fiber, and are squeezed and headed up by the machine before going into the trough. It is evident that the first cut to the right on a plate and the last cut on the other side are blanks, though it would seem that an automatic weigher, as in coining, would reject these into the waste heap. The difficulty of the operation lies in the fact that the cuts must be alternate, so that the cutter must either turn half round at each cut, or the plate must be turned over. The great desideratum is to do this automatically and reciprocally. There is no common or unvarying standard for classifying nails. The old way is by sizing from two-penny, 1 in. long, and now 880 to the lb., up to thirty-penny, 4½ in. long, and 16 to the lb. The English names, 7 lb., 8 lb., etc., show that 1000 of that kind should weigh so much. They now, in fact, seldom do. The general divisions are:

a. Material—copper, galvanized, etc.
b. Make—wrought, cut, cast.
c. Length or weight.
d. Size—fine, bastard or medium, heavy.
e. Points—flat, sharp, clinch.
e. Heads—spur, clasp, clout, countersunk, etc.
f. Use—scupper, sheathing, fence, slating, finishing, etc.

NAIN, a village of Galilee, mentioned only in the New Testament as the place where Jesus restored to life the widow's son. Eusebius and Jerome describe it as near Endor. Phocas places it n. of Tabor. The crusaders recognized it, and at the present day it is mentioned by travelers. It is now a small village of 20 houses or huts, and called Nein, containing remains of very ancient buildings and a fountain. It is 4 m. from Tabor, and 2¼ m. from Endor. Its situation is beautiful, on the n.w. edge of the "Little Hermon," or Jebel-ed-Dûhy, where the ground slopes into the plain of Esdraelon. The entrance to the place, where the Savior met the funeral, was doubtless up the steep ascent of the plain. On the w. of the village the rock is full of sepulchral caves. On the n. are the wooded hills of Galilee.

NAIN DE TILLEMONT. See TILLEMONT.

NAIRN, in the county of the same name, is a royal, parliamentary, and municipal burgh, and is 15 m. n.e. by rail from Inverness. It is situated at the mouth of the river Nairn, on the w. side, and for that reason was anciently called Iver-nairn. Lying on the southern shore of the Moray firth, which is here about 8 m. across, it commands a grand and extensive view of the coast of Ross-shire, including Cromarty bay, nearly opposite. Nairn was regalized by William the lion. It has little historical interest, and few objects worthy of antiquarian attention. It is principally remarkable for the excellence of its sea-bathing and artificial baths, in which respect it is equal, if not superior, to any town in the n. of Scotland, as a resort in summer. The temperature is mild and equable. The inhabitants enjoy a remarkable immunity from epidemic diseases. There is a commodious harbor. The town has a literary society, a museum, a newspaper, 3 branch banks, and a savings bank. It is conspicuous for good and cheap education. Pop. '71, 3,751. Nairn unites with Inverness, Forres, and Fortrose in sending a member to parliament.

NAIRNE, CAROLINA OLIPHANT, Lady, 1766–1845; b. Scotland; celebrated in her youth for her beauty, and called "the flower of Strathearn." She married, in 1806, William Murray Nairne, who became lord Nairne in 1824. She wrote many songs to the old popular tunes familiar to the Scotch peasantry. Among them are the well-known *Caller Herrin'; The Laird o' Cockpen;* and *The Land o' the Leal.* Her productions all appeared anonymously, and their authorship was not divulged till shortly before her death. Her complete works, with a life by the rev. Charles Rogers, appeared at Edinburgh in 1869.

NAIRNSHIRE is bounded on the n. by the Moray firth, and on its other sides by the counties of Inverness and Moray, of the latter of which it anciently formed a part. It extends n. and s. 22 m., and 15 m. from e. to west. Its area is 215 sq.m., or 137,500 acres, of which about 26,000 are under cultivation. Pop. '71, 10,225, including the burgh of Nairn. Along with Elginshire, it returns one member to parliament. Constituency (1879–80), 280; rental, £35,729. Nairn is the only royal burgh in the county, but there are the villages of Cawdor and Auldearn. The soil is for the most part light and sandy. There is, however, considerable agricultural activity, though the county is, perhaps, better known for its cattle-breeding. An important cattle "tryst" is held at Cawdor once a month during the greater part of the year. The climate of this county is distinguished for its salubrity, and the temperature is remarkably equable. The thermometer in the shade has not risen above 78° 8′, or fallen below 11° 2′, during the last 20 years. According to the latest observations, the yearly rainfall did not amount to more than 26 in., the greatest fall being in October, and the least in April. At Brackla distillery, which belongs to Robert Fraser, esq., from 40,000 to 50,000 gallons of spirits are manufactured annually. The river Nairn runs through the county in a beautiful valley, which presents particularly attractive and romantic scenery in the neighborhood of Cawdor castle, one of the residences of the earl of Cawdor. This castle is of uncertain antiquity, and is in an excellent state of preservation. It was the residence of the ancient thanes of Cawdor, one of whom is mentioned in *Macbeth.* About the year 1510 the estates belonging to the earldom passed by marriage from the old family of Calder into the hands of a son of the duke of Argyle, and are still in the possession of his descendants. Not a few other objects of antiquarian interest are to be found in the county of Nairn.

NAISSANT, a term applied in heraldric blazon to an animal depicted as coming forth out of the middle—not like *issuant* or *jessant* (q.v.), out of the boundary line—of an ordinary.

NAJA. See Cobra da Capello, *ante.*

NAKAMURA MASANAWO, a Japanese scholar and writer, b. in Yedo about 1825, one of a hereditary guild of learned men in the university of Yedo, under the patronage of the Tokugawa "tycoons." To his profound knowledge of Chinese and native literature, he added some acquaintance with the Dutch, but soon abandoned it for the English language, a dictionary of which he laboriously copied with the pen. In 1866 he went to England, and studied there two years. Returning to Japan in 1868, he went into seclusion with his master the tycoon, and while there translated into Japanese the constitution of the United States, Washington's farewell address, John Stuart Mill's essay "On Liberty," a copious selection of long passages from the works of standard American and English authors, and an anonymous plea in behalf of Christianity. Voluntarily resigning his rank among the gentry (samurai), he laid aside his two swords, founded a private school, and became a vigorous reformer and practical philanthropist. In 1875 he was made chief director of the imperial female normal school. He has also translated *Wheaton's International Law*, and Smiles's *Self-Help*. He belongs to that quiet but powerful class of men whose words and example have revolutionized Japan.

NAKAMOORA MASAUWO, b. Tokio, Japan, about 1826; from an early age a student of languages. He took an active part in the national scheme of education, and in 1866 went to England in charge of a number of Japanese students. Since his return to Japan he has assisted greatly in introducing the civilization of the west, has published a number of educational pamphelts and has translated the U. S. constitution into his own tongue, also many of the writings of eminent English and American essayists and publicists.

NAKHICHEVAN, on the Don, a thriving town of south Russia, in the government of Ekaterinoslav, on the right bank of the Don, and near the mouth of that river, two miles east of Rostov. It was founded in 1779 by Armenian settlers from the Crimea, and has (1867) 16,584 inhabitants, mostly Armenians, belonging to the Greek-Armenian church. The inhabitants are engaged in the manufacture of silver ornaments and woolen goods, and an extensive trade is carried on.

NAKSHATRA (a Sanscrit word of doubtful etymology, but propably a compound of an obsolete base, *naksha*, night, and *tra*, protecting, i.e., literally night-protecting) means properly star, and is used in this sense in the Vedas. At a later period it was applied to the asterisms lying in the moon's path, or to the mansions in which the moon is supposed to rest in her, or rather, according to Hindu notions, *his* path. The number of these asterisms was reckoned originally at 27, later at 28; and mythology transformed them into as many daughters of the patriarch Daksha, who became the wives of the moon. See Moon. Biot, the distinguished French astronomer, endeavored to show that the Hindu system of the Nakshatras was derived from the Chinese *sien;* but his theory, though supported by very learned arguments, has been refuted by prof. Whitney, in his notes to Burgess's translation of the *Sûrya-Siddhânta* (New Haven, United States, 1860), and by prof. Müller in his préface to the fourth volume of the *Rig-Veda* (Lond. 1862); for their arguments leave little doubt that the system of the Nakshatras originated from the Hindu mind.

NAKSHIVAN', a t. in Russian Armenia, near the Aras river; pop. 8,772. According to Armenian tradition it is the oldest city in the world, and was founded by Noah, after the flood. It passed into the hands of the Russians in 1827.

NALA is a legendary king of ancient India—a king of Nishadha—whose love for Damayantî, the daughter of Bhîma, king of Vidarbha, and the adventures arising from, or connected with it—the loss of his kingdom, the abandonment of his wife and children, and their ultimate restoration—have supplied several Hindu poets with the subject of their muse. The oldest poem relating to Nala and Damayantî is a celebrated episode of the *Mahâbhârata* (q.v.), edited both in India and Europe, and translated in Latin by Bopp; in German by Kosegarten, Bopp, Rückert, and Meier; and in English by dean Milman. The two other renowned poems treating of the same legend, but with far less completeness, are the *Nalodaya* (q.v.) and the *Naishadhacharita* of S'rî-Harsha.

NALODAYA is the name of a Sanscrit poem which is highly prized by the modern Hindus. Its subject is the story of Nala (q.v.), but more concisely narrated than in th episode of the *Mahâbhârata*, whence its contents are borrowed; and its reputed author is Kâlidâsa (q.v.). Great doubts, however, must attach to the attribution of the authorship, if by Kâlidâsa the author of *S'âkuntala* is meant, and not some other poet bearing the same name; for the merits of this poem consist neither in elevation of thought nor in richness of fiction: they are sought for by the Hindus in its elaborate and artificial diction, and in its alliteration of every variety, which, to a European mind of culture and taste, would be no more than an intolerable jingle of sounds, devoid of all poetical worth. The text of the poem, with a modern commentary, has been edited (Berlin, 1830) by F. Benary, and (Calcutta, 1844) by W. Yates, who added to his edition a free metrical translation of the text and an essay on Sanscrit alliteration.

NAMA'QUALAND, GREAT. The extensive region in South Africa n. of the cape Colony, extending from the Orange river, lat. 29° 30', to Walfish bay, lat. 23°, and stretching inland from the w. coast to the Kalihari desert, comprehending an area of about 100,000 sq.m., is known under the name of Great Namaqualand, being principally inhabited by wandering tribes of Namaquas (q.v.). This region is drained principally by a large periodical water-course, called the Oup, Borradaile, or Great Fish river, which, running from n. to s., a distance of about 450 m., joins the Orange river nearly at right angles, about 90 m. from its mouth. It is generally, except in its northern parts, where the country rises into extensive and lofty plateaus, a most sterile and barren region, and along a coast-line of upwards of 400 m. does not present a single running stream much less a navigable river, although a few little bays along the coast, such as Angra Pequena, Sandwich harbor, and Walfish bay, afford safe anchorages. The valley of the Oup is bounded on each side by ranges of flat-topped barren mountains, which to the eastward die away into the waterless though wooded flats of the Kalihari desert, and coastwards stretch into vast sandy downs, against which the southern Atlantic beats an unceasing surf, rendering landing very dangerous, and enveloping the coast in a perpetual mist. The chief productions of the region are cattle, for the rearing of which the country seems favorable. On the edge of the Kalihari, ivory and ostrich feathers are collected, and copper ore seems abundant in several localities. Guano is found at Ichaboe and many little islands on the coast, and considerable fisheries are carried on by cape houses in many of the bays.

The lion, giraffe, rhinoceros, hippopotamus, and large game generally, are still found in Namaqualand, although fast diminishing before the fire-arms of the Namaquas. The snakes are considered especially venomous. The gemsbok, eland, and other large antelopes, now almost unknown in the Cape Colony, are still numerous in the little-frequented wastes of this region. The climate is extreme, and though, on the whole, not unhealthy, is very trying to European constitutions. The water is generally brackish. The first English traveler in Namaqualand, was sir J. Alexander, who, in 1837, traversed it from n. to south. Charles John Andersson has also explored every part of it. Information on the region may be also found in the travels of Moffat, Campbell, and Le Vaillant. The native tribes, who may perhaps number about 40,000 souls, speak the Namaqua language, the purest type of the Hottentot.

NAMAQUALAND, LITTLE, is a division of Cape Colony s. of the Orange river, formerly part of the district of Clanwilliam, and included with the country n. of it under the general name of Namaqualand. It is a very barren region, covered with rugged volcanic-looking hills, through which the Gariep or Great Orange river appears, through some convulsion of nature, to have forced its way to the sea. Little Namaqualand has of late years afforded a very large supply of copper ore of excellent quality (in 1878 near 12,000 tons); but the mines, although well known to the Dutch 200 years ago, were not worked till after 1852. The principal river is the Orange of the colonists, which divides the Cape Colony from Great Namaqualand; all the other streams are merely periodical torrents, often dry for years. The seat of magistracy is at Springbok Fontein, about 80 m. from the principal harbor, Hondeklip bay, and where are situated the very rich mines of the Cape copper company. Many scattered tribes of Namaquas and Bastard Hottentots roam along the bank of the Orange river, and in the neighborhood of the mines are numerous Dutch farmers and English settlers. All the larger mammalia, except a few gemsbok, are extirpated; but troops of ostriches are still numerous on the grassy flats of the Bushman country. The geological features of this region are peculiarly interesting, and have been thoroughly explored by A. Wylie, on behalf of the Cape government. The rocks are generally of granite or gneiss, intersected with numerous veins of cupreous indications, and near the Oarnge river present many very curious features. The coast line extends for 100 m., with a few little bays, such as port Nalloth and Hondeklip, where there is tolerably safe anchorage, and generally presents a shore covered with low granite rocks. At Hondeklip bay a large boulder painted red forms a distinguishing landmark.

NAMA'QUAS, the principal existing tribe of the race generally known under the name of Hottentot. They inhabit the region called Great Namaqualand, n. of the Gariep or Orange river, and the country a few miles s. of it, as far as the Kamiesbergen. They are a pastoral people of rather predatory habits, and live under the rule of their chiefs, whose powers, however, are of a very limited nature. Differing from the Bosjesmen Hottentots, the Namaquas are a tall, well-made, active people, although presenting the usual peculiarities of the race, such as the light olive complexion, the oblique eye, and short tufted hair. They speak a dialect of the Hottentot language, which, however, differs considerably from that used by other tribes of that people. Mission stations of the Rhenish and Weselyan societies have been for many years established amongst them, and in a few localities, near the Cape Colony, with considerable success; and the New Testament and some elementary works have been translated into the Namaqua dialect. On the northern borders of the regions they inhabit, the Namaquas, under the chief

Africaner, the descendant of a fugitive slave from Cape Colony, have for many years kept up a predatory and bloody war with the tribes of Ovampos and Damaros, who live n. of Walfish bay. The total number of Namaquas cannot exceed between 50,000 and 60,000 souls, scattered over a region of at least 150,000 sq.m.; and there is every prospect of the pure Hottentot tribes soon becoming extinct, or at least absorbed, being gradually supplanted by the more energetic and civilized Bastard races, who, in point of civilization and appearance, are very little inferior to the ordinary Dutch Boer of Cape Colony. Many of the southern Namaquas possess wagons and oxen, and are employed in the transport of copper ore from the mines of Little Namaqualand to the shipping port at Hondeklip bay.

A few of the peculiar customs of the Hottentot tribes, described by Kolben nearly 200 years ago, may be still traced amongst the more remote tribes of the Namaquas; but contact with the Cape Colonists, and the efforts of the missionaries, have partially civilized this race, so that an ordinary Hottentot is quite as respectable a savage, or perhaps more so than his Betjouana or Amakosa brethren.

NAMAYCUSH (*Salmo namaycush*), a fish nearly allied to the salmon and trout, a native of the great lakes and interior rivers of North America. It is often taken of a size varying from 20 to 40 lbs., and is said sometimes to reach 60 lbs. It is much esteemed for the table. It is caught at the same fisheries with the still more prized whitefish (q.v.).

NAME (Sax. *nama*, Ger. *name*, Lat. *nomen*, Gr. *onoma*), the word by which a particular person or thing is signfied in distinction from other persons or things, A name attached to a person is called a proper name. Names distinguishing one individual from another have been in use from the earliest ages of human society. Among the Jews, the name given to a child either originated in some circumstance of birth, or was an expression of religious sentiment. Old Testament names are almost all original—i.e., given in the first instance to the person bearing them; but the Jews, like other nations, after accumlating a considerable stock of names, began to repeat them, and we find few names in the New Testament which had not been used before. In Old Testament times, it was an occasional practice to adopt a change of name on the occasion of an important event in one's life.

The Greeks bore only one name, given on the tenth day after birth, which it was the right of the father to choose, and alter if he pleased. The earliest Greek names are generally expressive of some quality in high estimation, as valor, skill, wisdom, or gracefulness (Callimachus, excellent fighter; Pherecrates, strength bringer; Sophron, wise; Melanthus, black flower). In later times, when the faith in the gods was on the wane, names derived from Apollo and Athene, or indicative of the favor of Olympus (Apollodorus, gift of Apollo), came more into fashion. The eldest son generally bore the name of his paternal grandfather, and the confusion arising from the repetition of the same name was attempted to be obviated by appending the father's name (either simply, or turned into a patronymic), the occupation, the place of birth, or a nickname.

The Romans at a very early period bore two names, and afterward every Roman citizen had three. The *prænomen*, like our Christian name, was personal to the individual—Caius, Marcus, Cneius; in writing, generally abbreviated to an initial or two letters, C., M., or Cn. It was given in early times on the attainment of puberty. and afterward on the ninth day after birth. There were about thirty recognized prænomina. Women had no prænomia till marriage, when they took the feminine form of that borne by their husband. Every Roman citizen belonged both to a *gens* and to a *familia* included in that gens. The second name was the *nomen gentilicium*, generally ending in *-ius*, *-eius*, or *-aius*. The third name was the hereditary *cognomen* belonging to the familia. Cognomina were often derived from some bodily peculiarity, or event in the life of the founder of the family. A second cognomen, or *agnomen*, as it was called, was sometimes added by way of honorary distinction. In common intercourse, the prænomen and cognomen were used without the nomen gentilicium, as C. Cæsar for C. Julius Cæsar, M. Cicero for M. Tullius Cicero. The Roman names were in their origin less dignified and aspiring than the Greek; some were derived from ordinary employments, as Porcius (swinehead), Cicero (vetch grower); some from personal peculiarities, Crassus (fat), Naso (long-nosed); a few from numerals, Sextus, Septimus.

The Celtic and Teutonic names, like the Jewish and Greek, had been originally very significant; but at an early period their exuberance became checked; people contented themselves with repeating the old stock. While the speech of Europe was undergoing a transformation, the names in use remained the same; belonging to an obsolete tongue, their signification by and by became unintelligible to the people using them. Many are derived from "God," as Gottfried, Godwin; some from an inferior class of gods known by the title *as* or *ans*, whence Anselm, Oscar, Esmond; others from elves or genii, Alfred, Alboin, Elfric (Elf King). Bertha is the name of a favorite feminine goddess and source of light, from the same root as the word "bright;" the same word occurs as a compound in Albrecht, Bertram. To a large class of names indicating such qualities as personal prowess, wisdom, and nobility of birth, belong Hildebrand (war brand), Konrad (bold in counsel), Hlodwig (glorious warrior), called by us Clovis, and the original of Ludwig and Louis. The wolf, the bear, the eagle, the boar, and the lion entered into the composition of many proper names of men, as Adolf (noble wolf), Arnold (valiant eagle), Osborn (God bear). Respect for feminine prowess also appeared in such names as Mathilde (mighty amazon), Wolfhilde (wolf heroine). The spread of Christianity threw a number of the old names into comparative oblivion, and introduced new ones. The name selected at baptism was more frequently taken from the history of the Bible or the church than from the old traditional repertory, which, however, was never altogether disused. Many names, supposed to be local and very ancient, particularly in the Scottish highlands, Wales, and Cornwall, are in reality but corruptions of names of Christian origin which are in use elsewhere. Owen, Evan, and Eoghan (the latter often anglicized into Hector) seem all to be forms of Johann or John. A change of name was sometimes made at confirmation.

Periods of religious and political excitement have had a very powerful influence in modifying the fashion in names. The Puritans would only admit of two classes of names, those directly expressive of religious sentiment—praise-God, live-well—and names which occur in Scripture; these latter indiscriminately made use of, however obscure their meaning, or however indifferent the character of the original bearer of them. Old Testament names were used in preference to New, probably because they did not convey the notion of a patron saint. Old Testament names still prevail largely in America, where exists a medley of Christian names from all possible sources. At the French revolution, names supposed to savor of either loyalty or religion were abandoned, and those of Greek and Roman heroes came into vogue instead. The Augustan period of English literature gave a temporary popularity to such feminine names as Narcissa, Celia, Sabina. In Germany, the names in use are particularly free from foreign admixture; they are almost all either of Teutonic origin, or connected with the early history of Christianity. In Britain, the number of names has, particularly since the reformation, been more limited than in most other countries. In some families of distinction, unusual names have been handed down from father to son for centuries—e.g., Peregrine among the Berties, and Sholto in the Douglas family. The accumulation of two or more Christian names only became common in the present century, and another practice which has gained ground in Britain is the use of surnames as Christian names. More recently, various old names, particularly feminine names, as Maud, Florence, Ethel, have been withdrawn from their obscurity, and resuscitated.

The use of fixed family *surnames* cannot be traced much further back than the latter part of the 10th century. They first came into use in France, and particularly in Normandy. At the Conquest, they were introduced into England by the Norman adventurers, and were general at the Domesday Valuation. Many of the followers of William had taken names from their paternal chateaux or villages on the other side of the channel, names which were used with the French preposition *de* before them. Their younger sons and others applied the "de" to estates awarded them as their portion of the conquered country, and called themselves De Hastings, De Winton, etc., a prefix probably never in vernacular use in England, and completely discarded with the disappearance of Norman-French, unless in a few cases where it was retained for the sake of euphony, or from coalescing with the initial vowel, as in De la Bèche, Danvers (d'Anvers), Dangerfield (d'Angerville). When English was used in place of Norman-French, the "de" was always rendered into "of." The affectation of resuming it in recent times is as unwarrantable in theory as in taste. Such a designation as lord De Tabley of Tabley House is an unmeaning tautology. The Scotch have a more expressive designation when they say Colquhoun of that Ilk. In France and Germany, a territorial surname (denoted by "de" or "von") came, when surnames spread to all classes, to be the mark of nobility, so much so that in latter times, when any one was ennobled by the sovereign, the "de" was prefixed to his previously plebeian and not territorial name. In Britain, the "de" was never considered the test of nobility; the names of some of the most distinguished families were not territorial—e.g., Stewart, Butler, Spencer. In Scotland, surnames were hardly in use till the 12th c., and were for a long time very variable. The assumption of surnames by the common people is everywhere of much later date than their use by noble (gentle) families. As yet, they can hardly be said to be adopted by the people of the wilder districts of Wales.

There are many existing local surnames in Britain besides those derived from the names of the manors of the gentry or landholders. Farms, homesteads, the natural features of the country, all gave their names to those who resided at or near them; hence such names as Wood, Marsh, Dale. The preposition "at" is in a few cases retained, as in Atwood, A'Court, Nash (atten-ash, i. e., at the ash). The traveling habits of the Scots account for such names as Inglis, Fleming, Welsh (the original of Wallace), applied to those who had visited foreign parts; and sometimes a Scotsman, wandering into England, returned with the acquired name of Scott.

A large class of surnames are patronymics, often formed by "son," or its equivalent in the language of the country, added to the Christian name of the father. Names of this sort often fluctuate from generation to generation. Alan Walterson had a son, Walter, who called himself Walter Alanson. The genitive case of the father's name sometimes served the same purpose, as Adams, Jones; and similarly in Italian, Dosso, Dossi. A fashion of using "Fitz," the equivalent of "son," before the ancestral name, as in Fitz-herbert, prevailed temporarily in Normandy, whence it was imported into England. In the highlands of Scotland, the prefix "Mac" (Macdonald) served the same purpose, which, however, fluctuated far longer than the patronymic surnames of England and the lowlands; so also the "O" (grandson) of the Irish (O'Neil), and "Ap" of the Welsh (Ap Rhys, otherwise Apreece). The "de" of France had sometimes a similar origin, as in d'André d'Hugues; and still more frequently the "de," "dei," or "degli" of Italy—di Cola, di Giacomo.

Office, occupation, or condition, gives rise to surnames—e.g., Knight, Marshall, Page, Smith, Brewster, Shepherd; in Germany and Holland, Rauber and de Rogver (robber), and from such appellatives, patronymics may be again derived; thus, we have Smithson, de Maistre (master's son), M'Nab (son of the abbot), M'Pherson (son of the parson), del Sarto (son of the tailor), etc. So also personal qualities—Black, White, Strong, Stark, Lang (long), Littlejohn, Cruikshanks; and nicknames have not infrequently been perpetuated as surnames. We have also surnames derived from the signs and cognizances which were borne in the middle ages, not only by inns and shops, but by private houses. John at the Bell became John Bell; at Middleburg, in Holland, Simon, apothecary in the "Drake," or Dragon, became Simon Draek; hence, probably, the frequency of family names derived from animals, and also of those beginning with "Saint;" though this last class may, perhaps, sometimes have had its origin in the first owner of the name dedicating himself to the service of the saint in question. In Scotland and Ireland, "The" is a distinctive title borne by the heads of some old families—as "The Chisholm," "The O'Connor Don." In the highlands of Scotland, the chief a clan is usually addressed by the name alone in a marked manner: thus, "Macleod" implies specially Macleod of Dunvegan, in Skye, head of the clan Macleod; "Mackintosh," in like manner, applies solely to Mackintosh of Moy, in Inverness-shire.

In England, the number of existing surnames approaches to 40,000, or about one to every 500 individuals; in Scotland, there are far fewer surnames in proportion to the population. The remarkable predominance of certain surnames in certain localities—as Campbell, Cameron, Maclean in Argyleshire, Macdonald in Inverness, Mackay in Sutherland, Gordon and Forbes in Aberdeenshire, and Scott, Ker, Elliot, Maxwell, and Johnstone on the borders—arises from the clansmen having made a practice of taking the name of their chiefs, considering themselves members of their family by adoption, if not otherwise. Elsewhere than in Scotland, vassals often adopted the names of their lords, and servants those of their masters. Two or more surnames are often borne by one individual, in which case the paternal surname is sometimes placed first, sometimes last; and, in recent times, it is by the name which occurs last that the bearer of the two surnames is most frequently known.

The wife, with us at least, changes her surname to that of her husband on marriage. In the continent, it is not unusual for the husband to append his wife's name to his own; and in Spain, the wife retains her own name, while the son is at liberty to use either paternal or maternal name as he pleases, the choice generally falling on the best family.

Change of Name.—Prior to the reformation, surnames were less fixed than they have since become. Occasionally, younger sons, instead of retaining their patronymic, adopted the name of their estate or place of residence. A great matrimonial alliance was a frequent cause for adopting the patronymic of the wife. With the clergy, ordination was a common occasion of a change of name, the personal surname being exchanged for the name of the place of birth—thus, William Longe became William of Wykeham. In time of political troubles, a new name was often assumed for concealment; and in Scotland, the name of McGregor was proscribed in 1664 by an act of the privy council. In modern times, injunctions in settlements of land, and deeds of entail, are frequent grounds for a change of name, it being made a condition that the devisee or disponee shall assume a certain surname under penalty of forfeiture, a stipulation which the law recognizes as valid. Such an obligation is often combined with one relative to arms. In a Scotch entail, it is a very frequent condition that each succeeding heir of entail, or husband of an heiress of entail, shall assume the entailer's name and arms, or his name and arms *exclusively;* in the former case, he may, if he pleases, continue to use his own surname along with the assumed one. The heir of entail is not held legally to take up any arms not otherwise his own, unless he have applied to the heraldic authorities for leave so to do. Where a Scotch entail contained an injunction to bear arms which had no existence in the official record of arms, the condition has not been held to be null; the heir of entail must apply to the lord lyon for a grant of arms bearing the designation of those disponed. In England, it used to be common to obtain a private act of parliament to authorize one to change his surname; an authority for such a proceeding has generally been given in later times by royal license, which is granted only on a reasonable ground being established for the alteration, to the satisfaction of the kings-at-arms, to whom a remit is made. It has sometimes been supposed that this royal license is necessary to legalize such a change, but the highest legal authorities have laid it down that there is nothing in the law of England to prevent any one, who may consider it for his interest so to do, to change his surname, or even his christian name. The idea, lately prevalent to some extent, is equally erroneous, that an advertisement in a gazette or newspaper, or the execution of some deed, is a necessary form in order to effect a change of name. There are always great inconveniences in changing one's name, which sufficiently account for the general indisposition to do so, except from a questionable motive. As there is no law to prevent a person from changing his name, so there is, on the other hand, no law to compel third parties to use the new name, and disputes and annoyances arising from such a state of things are matters of course. The change tends, to a certain extent, to destroy the means of identification after the lapse of years, which may or may not be the object desired. Notwithstanding these difficulties and inconveniences, there are many examples of persons who have succeeded after a few years in being generally known under a new name, and of the public as well as his friends recognizing it. The change of name, in general, produces no change whatever on the legal status. A party is equally punishable for swindling, larceny, and other cognate offenses, whatever name he uses; and, on the other hand, if he is legatee, he is not prevented from establishing and receiving his legacy, whatever name he has adopted. It follows from what precedes that no person is punishable for using a new name, though it is sometimes an ingredient for a jury to take into consideration when they are required to infer a particular motive of conduct. The royal license is practically required to be obtained by Englishmen (not Scotchmen) holding commissions in the army, as also when the change of name is to be accompanied by a change of arms, it being the practice of the English heralds' college to refuse to grant arms corresponding to such change, unless the royal license have been obtained. In Scotland a *bona fide* change of name requires neither royal, judicial, nor parliamentary authority, the sole exception being the case of members of the college of justice, who require the permission of the court of session. A royal license is not generally applied for by natives of Scotland, as it is not required to be produced to the lord lyon on applying for a corresponding change of arms. The arms will generally be granted when the lord lyon is satisfied that the change has been made on some reasonable ground, and not from a purely capricious motive; and the fact of the change of name, with the reason why it has been made, are narrated in the new patent of arms. When such change of surname and corresponding change of arms has been made by a Scotsman who is an officer in the army, the authorities of the war office are in the habit of requiring a certificate from the lyon office to the effect that the change is recognized there.

Names of Places.—These, like names of persons, belong, in a great measure, to the language of past races. All over Great Britain, a very large proportion are derived from the Celtic names for natural features of the country. From *gwysg*, *afow*, *tam*, *tav*, *cluyd*—in the Celtic speeches equivalent to *water* or *river*—we have Esk, Avon, Wye, Thames, Tavy, Clyde. *Pen* or *ben*, hill, gives rise to the names of hills in England and Wales (Penrhys, Penzance), and still more in Scotland (Ben Nevis). So, also, *cwm*, *comb*, valley—as in Cumberland, land of valleys. The memory of the Roman invasion has been preserved in the termination *chester* (derived from *castra*) in the names of towns, as Manchester. Though surnames often originated in local names, the reverse process also occurred; as where *ville*, *ton* or *ington*, *ham*, or *burgh*, has been appended to the name of the owner of the land, e.g., Charleville, Johnston, Wymondham, Edinburgh (i.e., Edwin's burgh).

See Pott's *Die Personennamen und ihre Entstehungsarten* (2 vols., 1853; 2d. ed. 1859); Miss Yonge, *History of Christian Names* (Lond. 1863); Lower, *On English Surnames* (Lond. 1849); professor Innes, *Concerning Some Scotch Surnames* (Edin. 1860).

NAMES (*ante*). It is well settled in the United States that no process of law is necessary to effect a change of name. The reason is seen in the fact that names are not originally given by the law, but are established by usage. Thus the foundling named by the first-comer has, from every legal point of view, as good a right to that name if commonly applied to him during his youth as if he had been christened by the highest ecclesiastical authority. Again, a change of name can in any event have but little legal significance; for, if John Doe signs a conveyance as Richard Roe, he cannot void the agreement on that ground; or, if he so signs a bond, he will be estopped from setting it up as a defense. Where the maker of a will has for many years gone under a name not that given to him by his parents, and signs the will in the assumed name, the instrument will not on that ground be set aside. So, in criminal practice, it is of no moment under what name the accused is indicated in a warrant, identification being the only requisite. Nevertheless, the legislatures of the different states have provided a legal process by which a change may receive legal sanction. In New York, application must be made to the county court, or, in New York city, to the common pleas, by petition, stating the grounds of the desire to change, and after due notice and publication an order is granted authorizing the use of the new name. In Massachusetts the application must be to the legislature; other states require application to the probate or surrogate's court.

NAMUR', a province of Belgium, bounded on the n. by Brabant and Liege, e. by Luxemburg, w. by Hainault, and s. by France. Area about 1400 sq. miles. Pop. Dec., '74, 319,386 The principal rivers are the Meuse—which entirely intersects the province—the Sambre, and the Lesse. Namur presents generally an alternation of fruitful valleys and low hilly tracts; but in some parts, where the heights constitute offshoots of the Ardennes and are densely wooded, they attain a considerable elevation. With the exception of the land in the s.w., where there are large tracts of bog and heath, the soil is extremely rich, yielding abundant crops and fine pasture. The chief products of Namur are wheat, oats, hops, oil-yielding plants, and flax. Besides iron, copper, lead, and coal mines, Namur has marble and slate quarries, and yields sulphur, alum, cadmium, alumina, flints, etc. It has good steel, iron, and smelting works, breweries, paper-mills, etc. Namur is divided into the three arrondissements of Namur, Dinant, and Philippeville. At the close of the 12th c., Namur was united to Luxembourg, after having existed as an independent countship for upwards of 150 years. Towards the middle of the 13th c., it passed by purchase to the house of Flanders, which retained possession of it till 1420; when, on the death of count John III., without direct heirs, the countship, which was in a state of extreme financial embarrassment, was purchased for 132,000 gold ducats, by Philip the good, duke of Burgundy, and subsequently shared the fate of the other Burgundian states.

NAMUR (Flem. *Namen*), the chief t. of the province of the same name, is situated at the confluence of the Sambre with the Meuse, and is a strongly fortified town and the seat of a bishop. Pop. '76, 25,066. Among its 17 churches, the cathedral, or St. Aubin's, which was consecrated in 1772, is one of the most beautiful churches of Belgium. Namur has an academy of painting, a conservatoire for music, two public libraries, a museum, an hospital for aged paupers, a theological seminary, and 2 colleges, one conducted by Jesuits. The present citadel was constructed in 1784, but the city has been fortified from the earliest period of its history; and in 1692, its defensive works were repaired and strengthened by Coehoorn, only, however, to be taken the following year by Louis XIV. and Vauban, the latter of whom added considerably to its original strength. The reputation of its citadel made Namur a prized stronghold in every war of later times; and after having been gallantly defended by its French conquerers in 1815, against the Prussians under Pirch, it was finally restored to the Netherlands after the battle of Waterloo, and at once put into thorough repair. Namur is noted for its cutlery, its leather-works, and its iron and brass foundries.

NÂN'AK, or NÂNEK. See SIKHS, *ante*.

NA'NAS, a t. of Hungary, in the midst of extensive morasses, about 110 m. e.n.e. from Pesth. The population, partly Protestant and partly Roman Catholic, is employed in cattle husbandry and agricultural pursuits. Pop. 11,300.

NANA SAHIB, a Hindu, one of the leaders of the sepoy revolt of 1857. He is said to be the son of a Brahman from the Deccan, and his real name was Dhundu Punt. He was b. about 1820, and was adopted as a son in 1827 by Bajee Rao, the childless ex-peishwa of Poona, thereby, according to Hindu law and custom, acquiring most of the rights of a legitimate son. He was educated as a Hindu nobleman—taught English, and brought much in contact with the European officers, in whose amusements he seemed fond of participating. A decision was, however, come to by the government of Calcutta, that they should not recognize rights to pensions or indemnities acquired by adoption; and in consequence, Nana Sahib was refused the continuance of a pension of eight lacs of rupees, paid to his adopted father under a treaty made in 1818. This is believed to have rankled in his mind, along with slights he received from the supercilious English youth with whom he came in contact. He was allowed to retain some of the state of a native prince—a retinue of 200 soldiers, with 3 field-pieces, and a fortified residence at Bithoor, 10 m. w. of Cawnpore. When the mutiny broke out in May, 1857, he offered to assist the English, but instead he treacherously placed himself at the head of the mutineers. The European troops were induced, on June 25, to capitulate to Nana Sahib, who promised they should be sent down the Ganges in safety. They got on boats provided for them, but had no sooner done so than two guns were unmasked, and a murderous fire was opened upon them. The sepoys were ordered to shoot the men, but to spare the women and children, who, when their husbands and parents had been shot, were removed to a house in Cawnpore. On July 15, sir H. Havelock, who had advanced to their assistance from Allahabad, defeated the sepoys in two engagements, one within 8 m. of Cawnpore; and Nana Sahib next day directed that the women and children should be put to death, an order carried out with unparalleled atrocity. A long series of engagements against Nana Sahib followed, in which he was always the loser, and he was ultimately driven beyond the English frontier into Nepaul. In 1860 his death was announced, but, two years later, new movements were discovered, which were attributed to him, and it is not certainly known whether he is dead or alive. Several persons have been arrested on suspicion of being Nana Sahib, but in all cases a mistake has been made. A column has been erected at Cawnpore in memory of those who perished in the massacre.

NANCY, a beautiful t. of France, capital of the department of Meurthe-et-Moselle, is situated on the left bank of the river Meurthe, at the foot of wooded and vine-clad hills, 220 m. e. of Paris, on the Paris and Strasburg railway. Pop. '76, 66,303. It is divided into the old and new towns (the former irregular and with narrow streets, the latter open and handsome), and comprises also two suburbs. It contains many handsome squares and imposing edifices, and owes much of its architectural ornamentation to Stanislaus Leczinsky, who, after abdicating the crown of Poland in 1735, continued to reside here as duke of Lorraine till his death in 1766. His statue stands in the place Royale, a fine square, surrounded by important public buildings, as the hôtel de ville, theater, etc. The gates of Nancy look more like triumphal arches than the ordinary entrances of a town. Among the institutions are the university-academy, the normal school, the school of medicine, the lyceum, the public library, and numerous art and scientific societies. Cotton, woolen, and linen manufactures are carried on; but the principal branch of industry is the embroidering of cambric, muslin, and jaconet goods. Nancy is known to have existed in the 11th century. Two centuries later, it became the capital of the duchy of Lorraine (q.v.). Charles the bold was killed while besieging Nancy in 1477.

NAND'IDÆ, a family of fishes found in the fresh waters of India, containing three genera, *badis*, *nandus*, and *catopra*. They resemble the basses and sunfishes of America.

NAN'DU, or AMERICAN OSTRICH (*rhea*), a genus of South American birds allied to the ostrich, cassawary, and emu, and most nearly to the ostrich, from which it differs in having the feet three-toed, and each toe armed with a claw; also in being more completely feathered on the head and neck; in having no tail; and in having the wings better developed and plumed, and terminated by a hooked spur. The wings are, indeed, better developed than in any other of the *struthionidæ*, although still unfit for flight. The neck has 16 vertebræ. There are at least three species. The best known species (*R. Americana*) is considerably smaller than the ostrich, standing about 5 ft. high. It is of uniform gray color, except on the back, which has a brown tint. The male is larger and darker-colored than the female. The back and rump are furnished with long feathers, but of a more ordinary kind than those of the ostrich. This bird inhabits the great grassy plains of South America, southward of the equator, abounding on the banks of the La Plata and its more southern tributaries, and as far s. as lat. 42° or 43°. Its range does not extend across the Cordilleras. It is generally seen in small troops. It runs with great celerity, using its wings in aid. It is polygamous, one male securing possession of two or more females, which lay their eggs in a common nest, or drop them on the ground near the nest, to which the male rolls them. Contrary to the usual habit of birds, incubation is performed by the male. The Nandu is shy and wary, but is successfully hunted by the Indians, generally on horseback. The flesh of the young is not unpleasant. The Nandu is capable of being domesticated.—A smaller and more recently-discovered species (*R. Darwinii*) has light-brown plumage, each feather tipped with white. It inhabits Patagonia. A third species (*R. macrorhyncha*) is distinguished by its large bill.

NANKEEN' CLOTH. Calico of the kind called "nankeen," or naked, was formerly imported extensively from China to Europe, and said to be the manufacture of Nanking; the color, a yellowish-buff, being a favorite one. It was supposed that the Chinese held a secret for dyeing this color, which was found to be remarkably durable; but it became known that it was not an artificial color at all, the cloth being made of a colored variety of cotton, which was produced occasionally in China and India. Artificially dyed nankeen cloths now form a considerable export from England to China.

The color of artificial nankeen cloth is produced by an elaborate process, in which the yarn or cloth is first dipped in a saturated solution of alum; then in a decoction of oak-bark; then in a bath of lime-water; and next in a bath of nitro-muriate of tin. Another, but less permanent, nankeen dye is produced by boiling annatto in a strong solution of pearl-ashes, and diluting with water to the required tint.

NANKING', capital of the province of Kiangsu, formerly the capital of China, on the Yangtse river, 90 m. from the beginning of its estuary, n. lat. 32° 40' 40", e. long 118° 47'. Its name signifies the southern capital. Since the removal of the seat of government to Peking (northern capital) it has been called by the Chinese Kiangning-fu. The walls inclose an area of nearly 20 m. in circumference, the greater part of which, however, is entirely waste. They reach in many places an elevation of 70 ft., and are fully 30 ft. in thickness at the base. According to Chinese accounts, the population of Nanking was once 4,000,000, but a more recent estimate made it 300,000. As the city, however, has of late passed through so many vicissitudes, it is impossible to ascertain its present number of inhabitants. The inhabited portion of the walled area lies toward the west, and several miles from the bank of the river. It is no longer possible to speak of Nanking in the language which former travelers used. The barbaric desolations to which it was subjected during the Taeping rebellion left it a sort of wreck, and one can only describe it as it was, before the victorious assault of the rebels, Mar. 19, 1853. Nanking is the seat of the vice-regal government for the provinces grouped together under the name of Kiangnan. Here, as elsewhere in China, there was, and again is, a Manchu garrison, or military colony, separated by a wall from that portion of the city which is occupied by the Chinese. Some of the finest streets of Nanking were in the Tartar city; several being nearly 40 ft. wide, having a space in the middle of about 8 ft. in width, flagged with well-hewn blocks of blue and white marble, and on each side of this a brick pavement 14 ft. or more wide. A deep canal or ditch runs from the river directly under the walls on the w., serving to strengthen the defenses of the city on that side. The ancient palaces have all disappeared. The offices of the public functionaries were numerous, but, like the shops, presented the general features common to all Chinese towns. The objects most worthy the inspection of the traveler are found, in ruins, outside the precincts of the modern city. Among these is the summer palace of the emperor Kienlung. It consisted of a number of one-story buildings, with spacious courts between, and flanked by smaller buildings on the sides. Enough still remains to show that the workmanship was of the most elaborate and unique character. When under cultivation, the spot must have been exceedingly beautiful. The tombs of the kings are remarkable for their sepulchral statues, which form an avenue leading up to the graves; they consist of gigantic figures, like warriors cased in a kind of armor, standing on either side of the road, across which, at intervals, large stone tablets are extended, supported by huge blocks of stone instead of pillars. Among the buildings totally destroyed by the rebels was the far-famed Porcelain tower. It was erected by the emperor Yungloh, to reward the kindness of his mother; the work was commenced in the 10th year of his reign (1413), at noon, on the 15th day of the moon, in the 6th month of the year, and was completed in 19 years. The board of works was ordered, according to the plan of the emperor, to build a tower 9 stories high, the bricks and tiles to be glazed, and of "fine colors;" and it was to be superior to all others, in order to make widely known the virtues of his mother. Its height was to be 322 feet. The ball on its spire was to be of brass, overlaid with gold, so that it might last for ever and never grow dim. From its 8 hooks as many iron chains extended to the 8 corners of its highest roof; and from each chain 9 bells, suspended at equal distances apart; these, together with 8 from the corners of each projecting roof, amounted to 144 bells. On the outer face of each story were 16 lanterns, 128 in all; which, with 12 in the inside, made 140. It required 64 catties of oil to fill them. On the top of the highest roof were two brazen vessels, weighing together 1200 pounds, and a brazen bowl besides, weighing 600 pounds. Encircling the spire were 9 iron rings, the largest being 63 ft. in circumference, and the smallest 24 ft., altogether weighing nearly 5,000 pounds. In the bowl on the top were deposited one white shining pearl, one fire-averting pearl, one wind-averting pearl, one water-averting pearl, one dust-averting pearl, a lump of gold weighing 50 ounces, a box of tea-leaves, 1000 taels of silver, one lump of orpiment, altogether weighing 4,000 pounds; one precious stone-gem, 1000 strings of copper coin, two pieces of yellow satin, and four copies of Buddhist classics. Nanking continued in possession of the Tae-ping rebels till the successes of the troops under maj. Gordon had crushed one after another all their outlying forces, when at length, July 19, 1864, the city was stormed by the imperialist soldiers under the viceroy Tseng Kwo-fan. The last blow was thus dealt to the Tae-ping rebellion, whose principal leader perished by his own hand amid the blazing ruins of the palace he had occupied for 11 years. Since its recapture, Nanking has resumed its former position as the seat of the vice-regal government, but shows few signs of revival from its desolation. It has, however, been made the headquarters of a large military force, and also of an arsenal for the manufacture of cannon and other warlike stores on the European model. Although specified in the treaty of Tientsin (1858) as a river-port to be opened, little or nothing has come of this concession, and but few foreigners are resident in Nanking. Cotton grows abundantly near Nanking.

NANSEMOND, a co. in s.e. Virginia adjoining North Carolina; bounded on the n. by Hampton Roads, drained by Nansemond river and its branches, and crossed by the Seaboard and Roanoke, and the Atlantic, Mississippi, and Ohio railroads; 380 sq.m.; pop. '80, 15,904—8,177 colored. The surface is level, and heavily wooded with cypress, pine, and other trees. The soil is sandy. The principal productions are corn, wheat, oats, and sweet-potatoes. Co. seat, Suffolk.

NANTAS'KET, a narrow peninsula in Massachusetts that extends from Cohasset township into Massachusetts bay about 5 miles. The town of Hull is situated on it, about 9 m. by water and 22 by railroad from Boston. It is a popular summer resort, and has several hotels.

NANTES (anc. *Namnetes* or *Nannetes*), an important seaport t. of France, capital of the department of Loire-Inférieure, is situated on the right bank of the Loire, 30 m. from its mouth, and at a point of confluence with it of the Erdre and the Sèvre-Nantaise, both navigable streams. Besides railways, there is communication with the interior by steamers on the Loire. The natural beauties of the site have been much improved by art, and now, the noble river on which the town is placed, covered with craft of every size and description, the islands that stud its channel, the meadows that skirt its banks, and the bridges (upwards of 16 in number) that cross it and its tributaries here, combine to make the scene a highly picturesque one. Nantes contains numerous squares and churches. Several districts of the town are nearly as fine as the best districts of Paris, the old town having been pulled down between 1865 and 1870. This town possesses numerous striking and beautiful buildings; among which the cathedral of St. Pierre, containing the splendid monument of Francis II., the last duke of Bretagne, and of Marguerite, his wife; and the old castle, the temporary residence of most of the kings of France since Charles VIII., and built in 938, are the chief. There is a public library containing 50,000 vols.; a museum of paintings; and a museum of natural history. The quays, lined on one side with houses, and in some cases planted with trees, afford an agreeable and interesting promenade of about 2 m. in length. The most beautiful promenade, however, formed by the Cours St. Pierre and the Cours St. André, extends from the Erdre to the Loire. It is planted with four rows of trees, bordered with lines of palatial houses, and ornamented with statues. The harbor, 1968 yards in length, is capable of accommodating upwards of 200 vessels. Formerly, vessels of no more than

200 tons could reach the port, all vessels of greater burden unloading at Paimbœuf, at the mouth of the river; but within recent years, much has been done by dredging for the improvement of the river-bed, and large vessels can now reach the harbor. The chief manufactures of Nantes are varieties of linen and cotton fabrics, calicoes, flannels; musical, mathematical, and optical instruments; refined sugar and salt, chemical products, cordage, etc. It contains tan-yards, copper foundries, brandy distilleries, etc., and numerous establishments engaged in the various manufactures to which a port gives rise, as ship-building, the preparation of preserved meats, etc. In 1872 the imports of Nantes were valued at 70,000,000 of francs, the exports at 55,000,000. Pop. '76, 116,093.

NANTES, EDICT OF, the name given to the famous decree published in that city by Henri IV. of France, April 13, 1598, which secured to the Protestant portion of his subjects freedom of religion. Among its more important provisions were—liberty to celebrate worship wherever Protestant communities already existed; to establish new churches, except in Paris and the surrounding district, and in the royal residences; and to maintain universities, or theological colleges, of which they had four, those at Montauban, Saumur, Montpelier, and Sedan; adherents of the reformed faith were also to be eligible to all civil offices and dignities; but, on the other hand, they were not allowed to print books on the tenets of their religion, except in those places where it existed; and they were obliged to outwardly celebrate the festivals of the Catholic church, and to pay tithes to the Catholic priesthood. From this period, the Reformers or Huguenots (who then counted 760 churches) had a legal existence in France, but gradually their political strength was crushed by the mighty genius of Richelieu—who, however, never dreamed of interfering with their liberty of worship. Neither did his successors, Mazarin and Colbert; but under the influence of a "penitence," as corrupt and sensual as the sins which occasioned it, Louis XIV., after a series of detestable *Dragonnades* (q.v.), signed a decree for the revocation of the edict, Oct. 18, 1685. The result of this despotic act was that, rather than conform to the established religion, 400,000 Protestants—among the most industrious, the most intelligent, and the most religious of the nation—quitted France, and took refuge in Great Britain, Holland, Prussia, Switzerland, and America. The loss to France was immense; the gain to other countries, no less. Composed largely of merchants, manufacturers, and skilled artisans, they carried with them their knowledge, taste, and aptitude for business. From them England, in particular, learned the art of manufacturing silk, crystal glasses, and the more delicate kinds of jewelry.

NANTUCKET, an island and t. upon it, on the s.e. coast of Massachusetts. The island is 15 m. long and an average of 4 wide, with an area of 50 sq.miles. It was bought from the Indians by Thomas Macy, in 1659, for £30 and two beaver-hats. Nantucket was at one time a great seat of the whale fishery, having, in 1775, had as many as 150 whaling vessels; but this branch of industry has declined since 1846, and since the civil war has become extinct. The harbor is commodious and safe. Nantucket has two newspapers; pop. (1870) 4,123.

NANTUCKET (*ante*), a co., t., and island, in Mass., is 18 m. s. of cape Cod, 85 m. s.e. of Boston, and is separated from Martha's Vineyard on the w. by a channel 8 m. wide. It is triangular in shape, has a level surface in the s., and is slightly hilly in the north. The soil, for the most part, is sandy and nearly destitute of trees or shrubbery. During the past fifteen or sixteen years farming and fishing have been the chief pursuits of the inhabitants, and, in the summer months, the town is the resort of invalids and pleasure-seekers. It has two banks, five public halls, several public schools, a weekly newspaper, and Baptist, Congregational, Episcopal, Friends, Methodist, Roman Catholic, and Unitarian churches. There is also a public library, containing about 5,000 volumes, and a museum of marine curiosities, the latter of which was founded in 1826 by admiral sir Isaac Coffin. A steamboat runs daily between the town and Wood's Holl, on cape Cod, connecting with a railroad to Boston.

NANT'WICH, a small market t. of Cheshire, England, on the Weaver, 20 m. s.e. of Chester. Many of its houses are interesting from their age and construction, being built, in many cases, of timber and plaster, and with overhanging upper stories. The parish church, one of the finest country churches in England, was thoroughly restored in 1864 at great cost. Nantwich was famous in former times for its brine-springs and salt-works. Shoes, gloves, and cotton goods are manufactured, and malting is carried on. Pop. (1871) 6,673.

NA'OS (Gr. a dwelling), the cell or inclosed chamber of a Greek temple.

NAPA, a co. on the coast of California, n of San Pablo bay; drained by Napa river, and Putah creek; 828 sq.m.; pop. 7,163, a part of which are Chinese. It has fertile valleys, and a range of mountains. The principal mountain is St. Helena, situated at the head of Napa valley, which rises 4,343 ft. above the sea. In the co. is a wonderful forest of petrified trees of large size, also springs of sulphur and borax, and a cinnabar or quicksilver mine. The leading products are wool, grain, butter, and wine. It is traversed by the California Pacific railroad. Co. seat, Napa City.

NAPH'THA is derived from the Persian word *nafata*, to exude, and was originally applied to an inflammable liquid hydrocarbon (or rather a mixture of several hydrocarbons) which exudes from the soil in certain parts of Persia. (According to Pelletier and Walter, it consists of three hydrocarbons—viz., $C_{14}H_{12}$, which boils at 190°; $C_{16}H_{16}$, which boils at 239°; and $C_{24}H_{22}$, which boils at 374°.) The term is, however, now used not only to designate a similar and almost identical fluid, that issues from the ground in many parts of the world, and is known as petroleum, rock-oil, etc., but is also applied to other liquids which resemble true naphtha in little else than their volatility and inflammability. Thus, wood-spirit, or methylic alcohol, is often spoken of as *wood-naphtha*, and acetone is sometimes described as naphtha. Coal-tar yields by distillation a liquid which has a heavier specific gravity and a lower boiling-point than Persian naphtha, but resembles it in general properties, and can generally be substituted for it. See GAS-TAR.

Crude naphtha, whether occurring as a natural product or as obtained from coal-tar, is purified by agitation with strong sulphuric acid; after which it must be well washed with water (in which it is quite insoluble), and finally distilled from quicklime. Pure naphtha is colorless, and of a peculiar taste and odor; it is soluble in about eight times its bulk of alcohol, and dissolves in all proportions in ether and in essential oils. Hot naphtha dissolves phosphorus and sulphur, but deposits them on cooling. It is an excellent solvent for gutta-percha, caoutchouc, camphor, and fatty and resinous bodies generally; and hence it is extensively used in the arts for these purposes, and its employment as a source of artificial light is now becoming universal. In consequence of its containing no oxygen, it is employed by chemists for the preservation of potassium and other metals, which have a powerful affinity for oxygen. Owing to its volatility and inflammability, it must be handled with great caution, many fatal cases having arisen from its vapor catching fire on the approach of a candle.

The principal kinds of naphtha known in commerce are native naphtha, coal naphtha, Boghead naphtha (also called paraffin oil and photogen), shale naphtha, and naphtha from caoutchouc and caoutchine.

Native naphtha, petroleum, or rock-oil is found in many parts of the world, as in Japan, Burma, Persia, the shores of the Caspian sea, Siberia, Italy, France, and North America. It is of various degrees of consistency, from a thin, light, colorless fluid found in Persia, with a specific gravity of about 0.750, to a substance as thick as butter, and nearly as heavy as water. But all the kinds when rectified have nearly the same constitution. They contain no oxygen, and consist of carbon and hydrogen compounds only. Bitumen and asphaltum are closely allied substances in a solid or semi-solid form. From a very early period in Persia and Japan, and at least since last century in Italy, native naphtha has been used to burn in lamps.

Coal-tar naphtha (see GAS-TAR), as stated above, is of a higher specific gravity than native naphtha—viz., from 0.860 to 0.900, and has a more disagreeable and penetrating odor.

Paraffin oil, for some time known also as Boghead naphtha, has become, of late years, so important a manufacture that a brief history of its origin cannot be uninteresting. In the year 1847 Mr. James Young, now of the Bathgate chemical works, had his attention called to a petroleum spring at Alfreton, in Derbyshire, from which he distilled a light thin oil for burning in lamps, obtaining at the same time a thicker oil, which was used for lubricating machinery. After a year or two the supply began to fail, but Mr. Young, noticing that petroleum was dropping from the sandstone roof of a coal-mine, conjectured that it originated by the action of heat on the coal-seam, the vapor from which had condensed in the sandstone, and supposed from this that it might be produced artificially. Following up this idea, he tried a great many experiments, and ultimately succeeded, by distilling coal at a low red-heat, in obtaining a substance resembling petroleum, which, when treated in the same way as the natural petroleum, yielded similar products. The obtaining of these oils and the solid substance paraffin from coal formed the subject of his now celebrated patent, dated Oct. 17, 1850.

In the years 1860 and 1864 long and costly litigations as to the validity of Mr. Young's patent took place in Edinburgh and London, resulting in the main in his favor. Many years ago Reichenbach had, by distilling 100 lbs. of pit-coal, obtained nearly 2 oz. of an oily liquid exactly resembling natural naphtha; and various other chemical writers were appealed to, as proving that methods substantially the same as Mr. Young's were previously known and practiced. One thing seeme to have been admitted, that previous to his patent no one had succeeded in producing the oil on a commercial scale.

The processes by which the oil and paraffin are obtained are simple. The material best adapted for the purpose was for years believed to be Boghead coal, a very rich gas coal, occurring in a field of limited extent near Bathgate, in Linlithgowshire. All cannel coals, however, give the same products, and some of them in nearly as large quantity; but, as stated below, shale is now generally used and treated in the same way. The coal is broken into fragments like road-metal, and gradually heated to redness in cast-iron retorts, which are similar to those used for coal-gas (see GAS). The retorts are most usually upright, about 10 ft. long and 14 in. in diameter at the bottom, tapering to 12 in. at the top, and built in sets of 3, 4, or 6, so that one fire may heat each set. The coal is fed by means of a hopper on the top of the retort, and after passing through it at a low red-heat, is drawn out as coke at the bottom, where there is a water lute to prevent the escape of oil or gas. There is a spherical valve in the hopper, counterpoised with a weight, which closes the retort at the top. The volatile matters distilled from the coal are conducted by a pipe to the condensers (similar to those used for coal-gas), where they are condensed into a thick black oil, of a specific gravity of about 0.900, along with a little water. Great care is necessary to prevent the heat from becoming too high, because gas and gas-tar, and not paraffin oil, are obtained when coal or shale is distilled at a high temperature. A ton of Boghead coal gave about 120 gallons of crude oil.

The crude oil from the first distillation is then distilled again in long cylindrical malleable-iron stills. From this second distillation a "green oil" is obtained, and the residue is removed as coke from the bottom of the still. This oil is then mixed with from 5 to 10 per cent of sulphuric acid, and afterwards with about the same quantity of soda, the mixtures being made in circular tanks with revolving stirrers. Both the acid and the soda mix with impurities, which fall to the bottom as heavy tarry matters, and are run off by a stop-cock, till only the clear supernatant oil remains. After being so far purified, the oil undergoes three further distillations, being at the same time treated with strong acid (1 per cent) and soda. The final result is that a small quantity of light naphtha is obtained in the later distillations, three-fourths of what is left being a light and nearly colorless oil used for burning in lamps, and the remainder a thicker oil containing paraffine. This latter portion is pressed in a hydraulic press, which squeezes out the greater portion of the paraffine, leaving an oil which is sold for lubricating machinery.

The crude paraffine, after being subjected to hydraulic pressure three or four times, is chiefly purified, by repeated crystallizations, from naphtha. Steam is afterwards blown through it in a melted state, and when finally treated with 8 per cent of animal charcoal it is an exquisitely beautiful substance, resembling the purest white wax. It is largely manufactured into candles, which equal, or even excel, in appearance those made from wax, and are only about half as costly. Paraffine has now a number of curious minor applications.

Shale naphtha, or "shale-oil," is a substance which has been manufactured, for many years, from bituminous shales, both in England and on the continent. Parly because the Boghead coal has become practically exhausted, but chiefly because the volatile products from it are more easily purified than from any coal, beds of bituminous shale found in the carboniferous formation are now almost entirely used in Scotland as the raw material from which paraffine oil and paraffine are obtained. Previous to 1856 these shales were turned to no account. See SHALE.

Naphtha from caoutchouc, or caoutchine, is obtained from caoutchouc by destructive distillation. In composition it consists mainly of hydrocarbons, having the same proportion of carbon to hydrogen as india rubber. Caoutchine has the reputation of being one of the best known solvents for india rubber.

Until the discovery of the Pennsylvanian, the Burmese (Rangoon) petroleum, or rock-oil, was one of the best known. It is obained in a treacly state by sinking wells about sixty feet deep in the soil, and consists of several fluid hydrocarbons, with about ten or eleven per cent of the solid hydrocarbon paraffine. The different naphthas it contains are highly prized as burning and lubricating oils, and for removing greasy stains, on account of their agreeable smell. The naphtha which is found abundantly at Baku, on the shores of the Caspian sea, closely resembles the Rangoon in its qualities. The Persian naphtha is frequently pure enough for burning without rectification.

Prominent among the wonders of our time, however, as regards new fields of industry and wealth, stand the discoveries of the naphtha, or, as they are called, the petroleum regions of the United States. Some of these sources of native naphtha were known to the Indians, by whom it was at one time collected for sale; but it is little more than twenty years since, by sinking deep wells, the great extent of the oil-bearing strata became known. The principal supplies are obtained in Pennsylvania, West Virginia, and Ohio, a considerable quantity being also obtained in west Canada. Other regions in North America produce it, but the Pennsylvanian yield is six or seven times greater than all the rest put together. Consul Kortright, in his report on the states of Pennsylvania, Ohio, etc., for 1870 and 1871, says: "The oil regions are 100 miles in length by 30 to 50 in breadth, and the number of wells to be tapped so great that the supply is considered to be sufficient for a century to come at least."

Much curiosity exists respecting the origin of these great natural sources of petroleum. It seems to be the general opinion of geologists that it has in most cases been produced by the decomposition of both vegetable and animal matters. In this respect it differs from coal, which has arisen from the decay of vegitable matter alone. It would appear that the Pennsylvanian oil proceeds from shales of carboniferous age; the Canadian from those of Devonian age. In both countries the oil is found in cavities in sandstone, and has therefore been derived from subjacent rocks. It is now known that petroleum has formed in rocks of nearly all geological ages. Prof. Dana, the American mineralogist, says that the conditions favorable to the formation of native naphtha, as shown by the characteristics of the deposits in which it is found, are: (1) the diffusion of organic material through a fine mud or clay; (2) the material in a very finely divided state; and (3), as a consequence of the preceding, the atmosphere excluded as far as possible from the material undergoing decomposition.

In Pennsylvania the first borings for petroleum took place in 1859, and in that year

82,000 bbls. (reckoned at 43 galls. each) were obtained; in 1861 the produce had reached 2,000,000 bbls.; and since then, as a rule, it has increased from year to year. In 1872 the total produce of North America was 7,394,000 bbls.; Canada furnishing 530,000 bbls. In the same year the total exports from the United States of refined petroleum amounted to 2,951,310 bbls., an enormous quantity, considering the first exports took place so recently as 1861. Of late years the petroleum trade is said to have employed in North America as many hands as coal-mining and the working of iron.

In 1862 and 1871 acts of parliament were passed limiting the amount of petroleum to be kept in store, and regulating the sale of such kinds as give off an inflammable vapor below 100° F. There are special warehouses for the reception of petroleum at the London and Liverpool docks.

Terrible accidents have now and then happened with some of the more inflammable American oils, by reason of their vapors exploding in the reservoirs of lamps. Most of these have, no doubt, taken place with oils whose vapors form an explosive mixture with air at a temperature below 100° F., but they can hardly be considered safe if their vapors will take fire on the approach of a light at less than 120° F. The vapor of the paraffine oil prepared for illuminating purposes by Young's mineral oil company, and no doubt by other firms, from Scotch shale, will not form an explosive mixture below 120° F., and it is therefore quite safe. Since this oil has to compete with petroleum, such a standard can only be kept up at a loss, and there is therefore a great temptation to keep down the firing-point of these burning oils as low as possible, with a view to greater profit; and although accidents have happened with paraffine oil, as well as with American petroleum, there is little doubt that the latter cannot be so thoroughly relied upon for safety. It could easily be made so, however, if the lighter hydrocarbons which it contains were carefully removed.

NAPHTALI, TRIBE OF, named after a son of Jacob, recorded as numbering 53,400 adult males at the exodus, being then the 6th in numbers among the 12 tribes. On its arrival at the outskirts of Palestine, it was only 8th in number. In the journey through the wilderness its place was n. of the tabernacle, near the tribes of Dan and Asher, with which it constituted the "camp of Dan." The ensign of the three is represented by the Jewish legends as a serpent, bearing the inscription "Return, O Jehovah! unto the many thousands of Israel." The territory allotted to Naphtali was situated in n.e. Palestine, bounded on the n. by the Leontes river, on the e. by lakes Galilee and Merom, and the Jordan, on the s. by the Zebulun, and on the w. by Asher. It included the w. shore of the sea of Galilee. Its surface and scenery were more diversified than those of the other tribes. Its s. portion, and especially the plains along the shore of the sea of Galilee were the most fertile region of Palestine. The tribe of Naphtali, under the leadership of Barak of Kedesh-Naphtali, repelled the invasion of the Canaanites under Sisera and Jabin (Judg. x.), and their valor is extolled in the song of Deborah. In the reign of Solomon, Naphtali was under the charge of Ahimaaz, his son-in-law. The head of the tribe in David's time was Jerimoth ben Azriel. In the reigns of Asa, king of Judah, and Baasha, king of Israel, Benhadad, king of Syria, "sent the captains of the host which he had, against the cities of Israel, and smote all Cinneroth, with all the land of Naphtali" (I. Kings, xv. 20). About 730, Tiglath Pileser ravaged n. Palestine and carried off the population to Assyria, and the history of the tribe ends at this point.

NAPHTHAL'IC GROUP OR SERIES. The starting point of the group is *Naphthalin* ($C_{20}H_8$), a substance of great interest in the history of organic chemistry, from its being that upon which Laurent chiefly founded his theory of substitutions. It may be obtained in various ways, but is most easily and abundantly produced from the last portions of the distillate of coal-tar, which become semi-solid on cooling. The liquid part of this mass is got rid of by pressure, and the naphthalin is then taken up by hot alcohol, from which it is obtained in a pure state by crystallization and sublimation.

Naphthalin crystallizes in large, thin, rhombic plates, which are unctuous to the touch, and have a pearly luster. Exposed to light under a glass covering, it gradually sublimes at an ordinary temperature in splendid crystals. It has a somewhat tar-like odor, and a pungent and somewhat aromatic taste. It fuses at 174°, and boils at 428°. Its specific gravity, in the solid state, is 1.15, and as a vapor, 4.528. It is not very inflammable, and when ignited, burns with a white smoky flame. It is insoluble in water, but dissolves readily in alcohol, ether, and the fixed and essential oils.

By acting on naphthalin with an excess of sulphuric acid, we obtain *sulpho-naphthalic acid* ($C_{20}H_8S_2O_6 + 2Aq$), from which, by substitution processes, a lare number of compounds are produced. With nitric acid, naphthalin yields nitro-naphthalin [$C_{20}H_7(NO_4)$], binitro-naphthalin [$C_{20}H_6(NO_4)_2$], and trinitro-naphthalin [$C_{20}H_5(NO_4)_3$], the group (NO_4), or its multiples, being substituted for one, two, and three equivalents of the hydrogen of the naphthalin. The final product of the prolonged action of boiling nitric acid on naphthalin is a mixture of oxalic and *naphthalic* or *phthalic acid;* the re-action being shown by the equation:

$$\overbrace{C_{20}H_8}^{\text{Naphthalin.}} + \overbrace{O_{16}}^{\text{Oxygen.}} = \overbrace{2HO,C_4O_6}^{\text{Oxalic Acid.}} + \overbrace{2HO,C_{16}H_4O_6}^{\text{Naphthalic Acid.}}$$

This acid is also obtained by the continued action of nitric acid upon alizarin, which is an important fact, since it indicates a connection between naphthalin and the coloring matter of madder.

Laurent has discovered a very numerous series of substitution compounds formed upon the type of naphthalin, into the composition of which chlorine enters. They are of little practical importance although their investigation has exerted a remarkable influence upon the progress of organic chemistry.

NAPIER, Sir CHARLES, K. C. B., English admiral, was cousin to the hero of Scinde and the historian of the peninsula war. His father was the hon. capt. Charles Napier, R. N., second son of Francis, fifth lord Napier. He was born March 6, 1786, at the family seat, Merchistoun Hall, in the co. of Stirling. At 13, he went to sea as a naval volunteer. In 1808, he received the command of the *Recruit*, 18 guns, and had his thigh broken by a bullet. He kept up a running fight, in his 18-gun brig, with the rearmost of three French line-of-battle ships, the *D'Hautpoult*, which escaped from Guadeloupe, and was thus instrumental in her capture. This obtained him a post-captaincy; but being thrown out of active service, he served ashore as a volunteer in the peninsular army, and was wounded at Busaco. Commanding the *Thames* in 1811, he inflicted an incredible amount of damage upon the enemy in the Mediterranean, and also conducted several desperate land operations with marked success. In 1814, he was ordered to America, and led the way in the hazardous ascent and descent of the Potomac. He afterwards took an active part in the operations against Baltimore. In 1829, he received the command of the *Galatea*, a 42-gun frigate, and was employed "on particular service" on the coast of Portugal. Becoming acquainted with the leaders of the constitutional party, he accepted the command of the fleet of the young queen; and by defeating the Miguelite fleet, he concluded the war, and placed Donna Maria on the throne. He was made admiral-in-chief of the Portugese navy, and attempted to remodel it; but official and corrupt influence was too strong for him, and he returned to England. In the war between the Porte and Mehemet Ali, he organized a land force, with which he stormed Sidon, and defeated Ibrahim Pasha among the heights of Mount Lebanon. He took part in the naval attack on Acre, and did not hesitate to disregard the orders of his chief, admiral Stopford, when he saw the way to bring the battle to speedy termination. He next blockaded Alexandria, and concluded a convention with Mehemet Ali. In 1847, he received the command of the channel fleet. When the Russian war broke out, he was sent out to command the Baltic fleet; but the capture of Bomarsund failed to realize the high expectations formed of Napier's exploits. He twice sat in parliament, and, until his death, Nov. 6, 1860, he labored with sucoess to reform the British naval administration. He was at the time of his death a vice-admiral and a knight of several foreign orders.

NAPIER, Sir CHARLES JAMES, G.C.B., English gen., one of several brothers distinguished for their bravery, three of whom—Charles, William, and George—were known in the peninsular war as "Wellington's colonels." They were sons, by a second marriage, of hon. col. George Napier, grandson of Francis, fifth lord Napier, who was fifth in descent, but through two females in succession, from the inventor of Logarithms. Charles, the eldest, was born at Whitehall, Westminster, Aug. 10, 1782. Before he had finished his twelfth year, young Napier received a commission in the 22d Foot. His first service was in Ireland, where he assisted in putting down the rebellion He commanded the 50th Foot during the retreat on Corunna; and at the fatal battle in which sir J. Moore fell, he was wounded in five places and made prisoner. Marshal Ney dismissed him, with permission to go to England on parole. On his return, he engaged in literary works, and even wrote an historical romance. In 1811, he returned to the peninsula. At Coa, where he fought as a volunteer, he had two horses shot under him. At Busaco, he was shot in the face, having his jaw broken and his eye injured. He recovered in time to be present at the battle of Fuentes d'Onoro and the second seige of Badajoz. After distinguishing himself in innumerable skirmishes, the daring soldier returned to England. He next took part in a fighting cruise off the Chesapeake, capturing American vessels, and making frequent descents upon the coasts. He did not return to Europe soon enough for Waterloo, but was engaged in the storming of Cambray, and accompanied the army to Paris. After the peace he was, in 1818, made governor of the island of Cephalonia, the affairs of which he administered with great energy and intelligence. Being, however, of an excessively combative disposition, he became embroiled with the authorities at home. In 1841 he was ordered to India to assume the command of the army at Bombay. This was the most splendid period of his career, resulting in the conquest of Scinde against terrible odds. His destruction of a fortification called Emaum Ghur in 1843, was described by the duke of Wellington as one of the most remarkable military feats he had ever heard of. The fearful battle of Meane followed, where Napier, with 1600 English and sepoys, defeated near 30,000 Beloochees, strongly posted, with the loss of 6,000 men. The Ameers surrendered, except Shere Mahomed, who brought 25,000 men into line of battle at Hydrabad. Napier had only 5,000 men, but in three hours his little army gained a decisive victory. A few days afterwards, Napier was in the palace of the Ameers, and master of Scinde. He was fortunate in possessing the entire confidence of lord Ellenborough, who made him governor of Scinde. His civil administration was scarcely less remarkable or less successful than his military operations. He gained the respect and reverence of the inhabitants, but soon became engaged in an acrimonious war of dispatches with the directors. In 1847, he returned to England. After attending a series of festivals in his honor, he lived in retirement until the disasters of the last Sikh war caused the eyes of his countrymen to be turned to the hero of Scinde as the deliverer of our Indian empire. He went to India, but found on his arrival that the Sikhs had been routed. He now turned his attention, as commander-in-chief of the army in India, to the subject of military reform. He bade a final adieu to the east in 1851, and returned to his native country, where he resided until his death, which took place at his seat, at Oaklands, near Portsmouth, Aug. 29, 1853. He had then attained the rank of lieut.gen., was G.C.B., and col. of the 22d Foot. It must be remembered to his honor that he was the first English gen. who ever recorded in his dispatches the names of private soldiers who had distinguished themselves, side by side with those of officers. Brave to rashness, ready alike with tongue, pen, and sword, quarrelsome with his superiors, but beloved by his soldiers, and, to crown all, of a strangely wild yet noble and striking appearance, Napier was one of the most remarkable men of his time, and in losing him the country lost one of its brighest military ornaments. His statue was, after his death, erected in Trafalgar square. The story of his *Conquest of Scinde* has been written by his brother, lieut.gen. sir WILLIAM FRANCIS PATRICK NAPIER, K.C.B., born Dec. 17, 1785, who served in the peninsular campaign and was engaged from 1824 to 1840 in preparing his *History of the Peninsular War*, the greatest military history in the English language. He died Feb. 12, 1860, at Scinde house, Claphman, and was followed in a few weeks to the tomb by his wife, lady Napier, niece of the great C. J. Fox. Her extraordinary skill in translating French documents written in cypher, and her indefatigable labors as her husband's amanuensis, are touchingly commemorated in the preface to the edition of the *History of the Peninsular War*, published in 1851.

NAPIER, JOHN, Laird of Merchiston, was b. at Merchiston castle, near Edinburgh, in 1550, and d. there on April 4, 1617. After attending the regular course in arts at the university of St. Andrews, he traveled for some time on the continent, and returned to his native country highly informed and cultivated for the age. Declining all civil employments, for which his many accomplishments eminently fitted him, he preferred the seclusion of a life devoted to literary and scientific study. From this time his history is a blank till 1593, when he published his *Plaine Discouery* (or "interpretation") *of the whole Reuelation of Saint John* (Edin. 5th ed. 4to, 1645), a work displaying great acuteness and ingenuity, but, it is scarcely necessary to add, not in any sense a "plaine discouery" of the apocalypse. In the dedication to king James VI. he gave his majesty some very plain advice regarding the propriety of reforming his "house, family, and court;" and on republishing the work he added a supplement, resolving "certaine doubts mooved by some well-affected brethren." About this time he seems to have devoted much of his time to the invention of warlike machines, but these inventions were never perfected, probably from motives of humanity. Like other eminent men of the time, Napier, though a strict Presbyterian, seems to have been a believer in astrology and divination, but there is no satisfactory proof that he ever practiced these arts. In 1596 he proposed the use of salt as a fertilizer of land, an idea which, though scouted at the time, is now generally received. Another large blank in his history here occurs, and terminates in 1614, at which date he first gave to the world his famous invention of logarithms (q.v.), in a treatise entitled *Mirifici Logarithmorum Canonis Descriptio* (4to, Edin.). This was followed by another work, *Rabdologiæ, seu numerationis per Virgulas libri duo* (Edin. 1617), detailing an invention for simplifying and shortening the processes of multiplication and division. See NAPIER'S BONES. He also prepared a second work on logarithms, showing their mode of construction and application, with an appendix containing several propositions of spherical trigonometry, and those formulæ which are now known by his name. This work was published after his death by his son Robert, under the title of *Mirifici Logarithmorum Canonis Constructio, etc., quibus accessere Propositiones ad Triangula sphærica faciliore calculo resolvenda, etc.* (Edin. 1619), and occurs along with the *Canonis Descriptio*. The latter work is included in baron Masere's extensive collection, the *Scriptores Logarithmici* (Lond. 1808). Napier's eldest son, Archibald, was raised to the peerage as the first lord Napier by Charles I. in 1627, and his descendants still bear the title. Two lives of Napier have been published, the one by the earl of Buchan (1787), and the other by Mr. Mark Napier (1834).

NAP'IER, MACVEY, 1776–1847; b. Scotland; educated at the universities of Glasgow and Edinburgh. He was intended for the law, and served an apprenticeship with a member of the society of writers of the signet, of which he afterwards became librarian. He was soon chosen by the society to fill a lectureship on conveyancing, newly established by the society, and soon after transferred into a professorship at the university of Edinburgh. In 1814 he was selected to edit the *Supplement to the Encyclopædia Britannica*. He was to have edited a new edition of that work, but was prevented by the failure of its publisher, Constable of Edinburgh. In 1830, on the accession of the whigs, he was appointed principal clerk of session, and resigned his office of librarian. He had long been an occasional contributor to the *Edinburgh Review*, to the editorship of which he succeeded upon the appointment of Jeffrey as dean of the faculty of advocates. Thereafter he wrote little himself, but he was a successful editor, and enjoyed the confidence of the many distinguished contributors to the *Review*.

NA'PIER, ROBERT, 1791–1876; b. Scotland; son of a blacksmith, who sent him to a grammar school, where he learned, besides the ordinary English rudiments, French, Latin, and landscape drawing. After serving an apprenticeship with his father he went to Edinburgh, and afterwards to Glasgow, where, in 1815, he began the blacksmith's business, with two apprentices. In 1823 he built his first marine engine, which was the beginning of a prosperity which gradually extended his works till they employed a force of 3,000 men. In 1830 he furnished the steamships for the Dundee and London shipping company; in 1839 he built the *Fire-King*, the fastest steamer then constructed, and in 1840 he supplied the Cunard company with their first four steamers. He received the great gold medal at the Paris exposition in 1855.

NAPIER, THE RIGHT HON. SIR ROBERT CORNELIS, Baron Napier of Magdala, was b. in Ceylon, Dec. 6, 1810, and was educated at the military college at Addiscombe. He entered the Bengal engineers in 1826, served in the Sutlej campaign, was wounded while acting as chief engineer at the siege of Moultan, and had a prominent share in the battle of Gujerat. As chief engineer of the Punjab, with the rank of col., he greatly developed the resources of the country. During the Indian mutiny he was chief engineer in sir Colin Campbell's army, and especially distinguished himself at the siege of Lucknow. For his services in the Chinese war of 1858 he was made maj.gen. and K.C.B. As commander of the expedition in Abyssinia in 1868 he achieved a brilliant success, both by his whole management of the short campaign and in the storming of Magdala, which ended it. On his return he received the thanks of parliament, an annuity of £2,000, and a peerage. In 1870 he was appointed commander-in-chief of the forces in India, and nominated a member of the Indian council. In 1877 he was made governor of Gibraltar.

NAPIER'S BONES, an invention of the celebrated Napier (q.v.) of Merchiston for the purpose of performing mechanically the operations of multiplication and division. The "bones" were narrow slips of bone, wood, ivory, or metal, about 3 in. long by $\frac{3}{10}$ths of an inch in breadth, and divided by transverse lines into nine compartments; each of these compartments being divided into two portions by a diagonal line running from the upper right hand to the lower left hand corners. The "bones were divided into sets, all those of one set having the same digit occupying the top compartment, and the several multiples of that digit occupying in order the eight lower compartments; when the multiple consisted of two figures, these were placed one on each side of the diagonal line. There was necessarily a set of bones for each digit. There was also another rod similarly divided into compartments, in which were placed the nine digits; this was called the *index-rod.* Multiplication was performed as follows; e.g., if 6795 is to be multiplied by 97834, four rods whose top digits were 6, 7, 9, 5 are selected and arranged in the order of the figures in the multiplicand, and the index-rod placed alongside them; the several figures of the multiplier are then sought for on the index-rod, the two lines of figures opposite each figure on the index are then added together diagonally, and the five sums thus obtained are arranged as follows:

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9|61155
7| 47565
8|  54360
3|   20385
4|    27180
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 664782030 = the product required.
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Division is performed in an analogous manner. The contemporaneous invention of logarithms for the same purpose of converting multiplication and division into addition and subtraction caused Napier's bones to be overlooked, and they are now scarcely ever used.

NA'PIERVILLE, a co. in s.w. Quebec, Canada, on the Grand Trunk railroad; 152 sq.m.; pop. '70, 11,688. Co. seat, Napierville.

NAPLES. The Italian provinces (formerly kingdom) of Naples and Sicily, or the Two Sicilies, occupy the south end of the Italian peninsula, and consist of the continental territory of Naples and the insula dependency of Sicily. The distinctive physical features of Naples and Sicily are noted under the names of the different provinces of Italy and in the article SICILY. They are favored by nature with a salubrious and almost tropical climate, unbounded fertility, and teeming population; and they present natural featurss of rare attractiveness. The rural population are an acute, frugal, and laborious race, and form a strong contrast to their idle, and debased brethren of the towns. For statistics of products, exports, and population, see ITALY and SICILY. Naples, in ancient times, was divided into numerous petty states independent of each other, and its inhabitants were of various races. Many of these states arose from Greek colonies, which had been founded in the country previous to the 7th c. B.C. The ancient historical importance of Naples is attested by the splendor of its cities, and the warlike renown of its population. On its conquest by the Romans, the great Neapolitan cities severally adopted the municipal, federative, or colonist form of government, and gradually assimilated their laws and customs to those of their conquerors. After the downfall of the Western empire, Naples was seized by Odoacer, but soon afterward (490 A.D.) it was subjected by the Goths, and in the following century by the Lombards, who established in it various independent duchies, as Benevento, Spoleto, Salerno, Capua, etc. Most of these were overthrown by invading bands of Arabs, Saracens, and Byzantines, who were in turn expelled, and the whole country subdued by the Normans in the 11th century. The Normans subsequently erected Naples and Sicily into a kingdom, and established a new political, ecclesiastical, and military system. To the Norman dynasty succeeded that of the Hohenstaufen, whose rule was marked by an immense intellectual and social advancement of the people; but the vindictive enmity with which the papal see regarded this dynasty, led to the invasion of Naples by Charles of Anjou, who, notwithstanding the heroic resistance of king Manfred (q.v.), by the battle of Benevento (1266) annihilated the power of the Honhenstaufen. The ascendency of Charles of Anjou was further effectually secured by the treacherous defeat and decapitation (1268) of Konradin (q.v.), the last male-heir to the throne. By the *Sicilian Vespers* (q.v.) the island of Sicily was, however, wrested in 1282 from his grasp, and became an appanage of the Spanish crown. The predominance of the Neapolitan Guelph or papal party during the glorious reign of Robert I., who was the patron of Dante and Boccaccio, the depraved libertinism of his heiress and granddaughter Joanna, the fearful ravages committed by predatory bands of German mercenaries and by the plague, the futile attempts of the Anjou sovereigns to recover Sicily, and the envenomed feuds of rival claimants to the throne, are the leading features of the history of Naples during the rule of this dynasty, which expired with the profligate Joanna II. in 1435; and was followed by that of Aragon, which had ruled Sicily from the time of the Sicilian Vespers. During the tenure of the Aragon race, various unsuccessful attempts were made by the house of Anjou to recover their lost sovereignty; and the country, especially near the coast, was repeatedly ravaged by the Turks (1480). In fact, after the death of Alfonso, the first ruler of the Aragon dynasty, the country groaned under a load of misery. Wars, defensive and offensive, were incessant, the country was inpoverished, and a conspiracy of the nobles to remedy the condition of affairs was productive of the most lamentable results, both to the conspirators themselves, and to the other influential Neapolitan families. In 1495, Charles VIII. invaded Naples, and though he was compelled to withdraw in the same year, his successor, Louis XII., with the treacherous assistance of Ferdinand (the Catholic) of Spain, succeeded in conquering the country in 1501. Two years afterward, the Spaniards under Gonsalvo di Cordova (q.v.) drove out the French, and the country from this time became a province of Spain. Sicily had previously (1479) been annexed to the same kingdom. During the two centuries of Spanish rule in Naples, the parliaments which had existed from the time of the Normans fell into desuetude, the exercise of supreme authority devolved on viceroys, and to their ignorance, rapacity, and oppressive administration may be solely ascribed the unexampled misery and abasement of this period. In the words of Sismondi, "no tax was imposed save with the apparent object of crushing commerce or destroying agriculture, and the viceregal palace and the tribunals of justice became public offices in which the highest dignities and most sacred interests of the state were openly bartered to the wealthiest bidder." During the Spanish rule, a formidable rebellion took place in 1647, headed first by Masaniello (q.v.), and afterward by Henry V., duke of Guise; the whole population of the province renounced their allegiance to their Spanish sovereigns, but the arrival of a new viceroy, who was equal to the occasion, resulted in the capture of the duke of Guise and the re-subjugation of the country. At length, during the war of the *Spanish Succession* (q.v.), Naples was wrested from Spain by Austria in 1707, and Sicily in the following year; but while Naples was secured to Austria by the treaties of Utrecht (1713) and Rastadt (1714), Sicily was handed over to Savoy by the former treaty. In 1720, however, both Sicilies were reunited under the Austrian rule, and in 1735 were given to Don Carlos, third son of Philip V. of Spain, who ascended the throne as Charles I., and founded the Bourbon dynasty. His reign was marked by equity and moderation; great reforms were effected in the administration of public affairs, science and literature were encouraged, and splendid works of public utility were erected throughout the kingdom. It was during his reign that Pompeii and Herculaneum were discovered. His successor, Ferdinand IV., followed in the course of legislative reform; but on the proclamation of the French republic (1789), his states were invaded by a French army, and the kingdom of Naples was erected into the Parthenopean republic (1799). Ferdinand retired with his court to Sicily, and for a brief period enjoyed the restoration of his sovereign rights in Naples; but a second invasion by Napoleon (1806) ended in the proclamation of his brother, Joseph Bonaparte, as king of Naples; and on this latter assuming the Spanish crown in 1808, that of Naples was awarded to Joachim Murat, brother-in-law of Napoleon. On the defeat and execution of Murat in 1815, the Bourbon monarch, Ferdinand IV., was restored. The liberal insurrectionary movements in Naples in 1821 and 1830 were the forerunners of the revolution of 1848; and in each case the party of progress was combated by the respective kings with ruthless severity, and perfidious concessions, to be canceled and avenged with sanguinary fury when the disarmed and credulous patriots were at the mercy of the sovereigns. See article GARIBALDI for the ultimate overthrow of the Bourbon dynasty in the kingdom of Naples, and its subsequent annexation to the kingdom of Italy under king Victor Emmanuel; also articles FERDINAND II. and ITALY. For the history of Sicily previous to its annexation to and during its various separations from Naples, see SICILY.

NAPLES (Ital. *Napoli*, anc. *Neapolis*), a city of southern Italy, capital of the province of Naples; is built partly at the base, partly on the slopes of two crescent-shaped acclivities on the famous bay of the same name. Pop. '72, 448,335. Lat. 40° 41' 8" n., long. 14° 15' 5" e. The wonderful beauty of the site and of the surrounding prospect, the delicious softness of the climate, and the clear atmosphere make Naples famed among the cities of the world. It is one of the chief centers of commerce and industry of Italy, possesses a very extensive mercantile shipping, and is one of the principal stations of Mediterranean steam navigation.

The public buildings of Naples are numerous and grand, but are devoid of architectural symmetry in consequence of the antiquity of their origin, and the irregularity of their site. Many of the old streets are paved with lava, and inconveniently narrow, with houses of great height. The modern streets, however, are spacious and splendid. The city is divided into the old and the new town, or the east and west crescents, by a lesser range of heights—viz., the Capodemonte, the St. Elmo, and the Pizzofalcone, terminating in the rocky promontory called the Castel dell' Ovo. In 1868 a land-slip destroyed a number of houses at the foot of Pizzofalcone. The eastern division of Naples is the most ancient and the most densely peopled; it contains the principal public structures, and is intersected by the splendid Via, or street, di Toledo. The western, or modern section, contains the famous Riviera di Chiaja, or the quay, a fine road running along the bay in a curved course of three miles, flanked on the right by a row of palaces, and bordered on the left by the beautiful pleasure-grounds of the Villa Reale, which lie between it and the sea, and of which the natural beauty is heightened by the interspersion of temples, fountains, and statuary groups amidst the acacia, myrtle, and orange groves. The public squares, or *larghi*, of Naples are adorned with fountains and obelisks; and within the precincts of the city there are several highly-prized springs both of fresh and mineral waters. The fortified castles are numerous. Amongst the principal are the Castel Nuovo, called the Bastile of Naples, somewhat similar to the Tower of London, and adorned with a fine triumphal arch, erected in honor of Alfonso of Aragon; the Castel dell' Ovo, so called from its oval or egg shape, standing on a promontory, and connected by a bridge with the main-land; the Castel Sant' Elmo, commanding a magnificent view from its ramparts, and formerly of immense strength; and the dismantled Castel del Carmine. The churches are upwards of 300, and many are rich in architectural and archæological interest. The cathedral dedicated to St. Gennaro (Januarius; q.v.) contains the celebrated phials in which the liquefaction of St. Gennaro's blood is alleged to take place on two annual festivals; it also contains the tombs of Charles of Anjou and of pope Innocent IV., besides numerous fine paintings and statues. The educational institutions of Naples embrace famous schools of surgery, law, and general science. A magnificent aquarium has been opened since 1871, with a zoological laboratory in which many distinguished foreign naturalists are at work. The philanthropical establishments are on an immense scale, and are richly endowed. There are also several theaters in the city, of which that of *San Carlo* (devoted to the opera) is one of the largest and most celebrated in Italy; but the characteristic theater of Naples is the *Teatro di San Carlino*, the headquarters of *Pulcinella* ("the Italian *Punch*"). There are four grand public libraries; and in the Museo Borbonico, Naples contains an unrivaled collection of art, comprising frescoes, paintings, mosaics, sculptures, bronzes, antiquities, coins, medals, inscriptions, and the renowned collection of precious objects excavated from Herculaneum and Pompeii.

The environs of Naples, apart from their extreme beauty of scenery, are highly interesting. The locality which contains the tomb of Virgil, the disinterred towns of Herculaneum and Pompeii, Vesuvius (from an eruption of which Naples suffered in 1872), and the Roman remains, must possess an inexhaustible source of interest for scientific, antiquarian, and classical investigators. The modern villas of Naples are splendid and luxurious. One of the most striking features of Naples is its unique population and the universal publicity in which life is passed. The inhabitants forever swarm in the thoroughfares, where an incessant throng of venders, purchasers, and idlers intermingle with asses, mules, hand-carts, and conveyances, dazzling the eye with their brilliant variety of costume, and the pantomimic expressiveness of their frantic gestures and attitudes; while the ear is stunned by the shrill conflicting cries of the ambulatory venders of every conceivable commodity, by the piercing notes of the improvisatore's song, and the uproarious hilarity and high-pitched patois of the countless masses, whose sole abode appears to strangers to be the thronged public squares and streets. The popular language of Naples, which is a corrupt dialect of Italian and Spanish, is in prevalent use among all classes of society; it lends itself especially to the satirical and facetious squibs and compositions in which the Neapolitans excel. The popular Neapolitan songs in the native patois are exquisitely naïve and expressive in sentiment, and are set to popular melodies which exert a maddening charm over this southern populace. The physical condition of the lower classes of Naples, and especially of the lazzaroni (q.v.), has of late years sensibly improved both as regards raiment and lodging

The name Naples (Gr. *Neapolis*, new city) had reference to an older town in the neighborhood, called originally Parthenope, and, after the foundation of the new town, Palæpolis (old town), which was situated most probably on the ridge called Posilipo, that separates the bay of Pozzuoli or Baiæ from that of Naples. Both towns were Greek settlements, apparently colonies from the neighboring Cumæ, joined by immigrants direct from Greece. In 327 B.C. Palæpolis was besieged and taken by the Romans, and thenceforth disappears from history; Neapolis submitted without resistance, and became a favored and faithful ally, or rather provincial city of Rome. It long, however, retained its purely Greek character and institutions; and there is evidence that the Greek language continued to be used, even in public documents, as late as the 2d c. of the Christian era. Naples was a flourishing and populous city during the Roman empire; and, notwithstanding the vicissitudes of the Gothic conquest of Italy, and the reconquests by the Byzantine emperors, it continued to be one of the most important and opulent places in Italy. About the 8th c. it threw off allegiance to the Byzantine emperors, remained independent till it fell into the hands of the Normans in 1140 A.D., and became the capital of the kingdom of Naples.

NAPLES, BAY OF, an indentation of the Mediterranean sea on the s.w. coast of Italy, opposite the city of Naples, is 20 m. wide from cape Miseno on the n.w. to cape Campanella on the s.e., and from this line extends inland for about ten miles. The scenery is very beautiful. On the shores are many towns and villages; the prospect is bounded on the east by mount Vesuvius, and on the outskirts of the bay are the islands of Ischia and Capri.

NAPLES-YELLOW is a pigment used by artists. It consists of antimoniate of lead, and is obtained by the direct combination of antimonic acid and oxide of lead under the influence of heat.

NAPOLÉON BONAPARTE, Emperor of the French, was b. at Ajaccio, in the island of Corsica, Aug. 15, 1769. (For an account of the family to which he belonged, see BONAPARTE, FAMILY OF.) At the age of 10 he entered the military school at Brienne, as a king's pensioner. Here he remained five years and a half. During that period he displayed a great aptitude and predilection for mathematics, history, and geography, and an indifference to merely verbal and literary studies. His manner was somber and taciturn, but as Bourrienne (who was his schoolfellow) says, this arose chiefly from the circumstance that he was a foreigner, poor, and unaccustomed to the use of French, which he first learned at Brienne. In Oct., 1784, he proceeded to the military school to complete his studies for the army, and in rather less than a year obtained his commission as sub-lieut. in the artillery regiment *de la Fère*. When the revolution broke out Napoléon was in garrison at Valence. He took the popular side, but in a quiet and undemonstrative way, for he did not love the boisterous enthusiasm of unmanageable mobs. When the armed rabble of Paris poured out to the Tuileries on the famous 20th of June, 1792, Napoléon, who was then in the city, followed the "despicable wretches" (as he called them), along with his friend Bourrienne; he saw them force the poor king to stick the red cap on his head, and smile fatuously from the windows of his palace. "It is all over henceforth with that man," said the young officer, and returned to Paris graver and more thoughtful than Bourrienne had ever seen him. After the scenes of Aug. 10 he left for Corsica, where gen. Paoli held the chief command. The excesses of the Septembrists and terrorists, however, induced Paoli to throw off his allegiance to the convention, and to seek the assistance of England. Napoléon was active but unsuccessful in his opposition to the designs of the general, and was obliged, along with his relatives, to flee from the island.

He now petitioned the convention for employment, and was sent to assist in the reduction of Toulon, with the rank of lieut.col. of artillery. The city was captured (Dec. 19, 1793) entirely through the strategic genius of Napoléon, and in the following February he was raised to the rank of brig.gen., and placed at the head of the artillery in the army of the south. Later in the year he was sent to Genoa, to examine the state of the fortifications of the city, and to discover the political disposition of the inhabitants. In the beginning of 1795 he was again in Paris seeking active employment, and thinking, from sheer ennui, of transferring his services to the sultan of Turkey. The convention was now in great peril, on account of the mutinous spirit of the arrondissements of the capital, and, on the suggestion of Barras, Carnot, Tallien, and others, Napoléon was made commander of the troops provided for its defense. On the 13th Vendémiaire (Oct. 4, 1795) the national guard, 30,000 strong, attempted to force its way into the Tuileries, where the convention was sitting, but was routed and dispersed by a terrible cannonade directed by the young artillery officer. Napoléon was immediately appointed to the command of the army of the interior. About this time he made the acquaintance of Josephine Beauharnais, whom he frequently met at the house of Mme. Tallien. Captivated by her elegant manners and amiable disposition, he proposed marriage to the graceful widow, and was accepted. The ceremony took place Mar. 9, 1796. A few days before he had been appointed to the supreme command of the army of Italy, and he was obliged to leave his bride almost at the altar. On his arrival he found the troops in a wretched condition. He had only 36,000 available men, and even these were half-starved and only half-clothed, to oppose to an Austrian and Piedmontese force of 75,000. Yet he was not afraid to undertake the conquest of upper Italy. Leaving Nice at the close of March, he won his first victory over the Austrians at Montenotte (April 11), which opened the Apennines for him; three days later a second success at Millesimo separated the allied armies; and, finally, his victory at Mondovi (on the 22d) compelled Sardinia to implore peace. He now hoped to utterly crush the Austrian army under Beaulieu, and at the battle of Lodi (on May 10) nearly accomplished it. His opponent did not venture to defend the line of the Mincio, but hastily throwing a garrison into the city of Mantua, retreated into the Tyrol. Napoléon immediately entered Milan, and took possession besides of all the principal cities of Lombardy. Now began that system of enormous and unscrupulous plunder in northern and central Italy which gives something of a barbaric character to the conquests of the French. The directory gave orders that Napoléon should levy contributions from all the states which he had gratuitously freed, and according to his own account he sent to France not less than 50,000,000 francs. His officers and commissaries actually seized whatever they wished, provisions, horses, and all manner of stores; and because Pavia ventured to make some slight resistance to the shameful extortions of the republicans, Napoléon gave it up to havoc for 24 hours. A body of savans (including Monge, Berthollet, and others) were dispatched to Italy to superintend the spoliation of its artistic treasures; and both now and in the subsequent Italian campaigns pictures, statues, vases, and MSS. were carried off in great numbers, to gratify the vanity of the Parisian sight-seers. In this way Lombardy, Parma, Modena, Bologna, and the states of the church were savagely harried before the end of June—Pope Pius VI., in particular, being forced to submit to conditions of extreme rigor.

Meanwhile Austria had resolved to make another effort for the recovery of Lombardy. About the close of July marshal Wurmser advanced from Trent at the head of 60,000 men, forced Napoléon to raise the siege of Mantua, but was himself defeated, with the loss of all his cannon, near Castiglione (Aug. 5), and again at Bassano (Sept. 8), in consequence of which he was driven to take refuge within the fortress of Mantua with some 16,000 troops—the shattered remains of his 60,000. Austria, however, was not disheartened. A *third* army was dispatched in two divisions: 30,000 from Carinthia, under marshal Alvinzi; and 20,000 from the Tyrol, under gen. Davidowich. This was a terrible campaign for Napoléon; his veterans were exhausted, his new supports had not arrived; he himself was despondent, while the Austrians were fresh and hopeful. At first the latter were completely successful; but the great victory of Arcola, won by Napoléon (Nov. 17) after three days' fierce fighting, in which he lost nearly all his general officers, decided the fate of the campaign. His dispatches to the directory, penned about this period, show how thoroughly he apprehended the state of parties in Italy, and also how utterly indifferent he was to any considerations beyond those that advanced the interests of France. In Jan., 1797, a fourth campaign was commenced by Austria. At the head of 50,000 fresh troops, Alvinzi descended from the Tyrol, but was completely routed by Napoléon at Rivoli, on the 14th of the month; while, not long after, Wurmser was starved into surrender at Mantua. A *fifth* army was assembled on the Tagliamento, under the command of the archduke Charles; but his troops were mainly raw recruits, while those of Napoléon were inured to war and flushed with innumerable triumphs. In consequence he was forced to retreat, which, however, he did slowly and in good order, hoping to surround his opponent in the interior of the country. Napoléon's design was to march on Vienna, and he actually penetrated as far as Judenburg, in upper Styria, only eight days' march from the capital. The Austrian government at length was seized with alarm, made overtures of peace, and finally on Oct. 17, 1797, the famous treaty of Campo Formio was signed, by which Austria ceded the Netherlands, Lombardy, and some other smaller territories to France; while she herself obtained in return, through disgraceful treachery on the part of the victor, possession of the province of Venice. It is generally said that Napoléon's military genius was never more brilliantly displayed than in these early Italian campaigns. In ingenuity of plan, celerity of movement, audacity of assault, he far outshines all his adversaries; it is, moreover, but just to him to state, further, that he made desperate efforts to stop the excesses of the most scoundrelly commissariat in Europe; and that while in the main he showed no hesitation in carrying out the brigand-like orders of the directory, he does not appear to have appropriated a single penny to himself. It was power, not gold, that he cared for.

In Dec., 1797, Napoléon returned to Paris, where he was received with the utmost enthusiasm. At this time there was much talk, and probably some vague design, on the part of the directory, of invading England, and Napoléon was appointed commander-in-chief of the invading army. It has been thought, however, that this was merely a feint to mask the real design of the directory; viz., the invasion of Egypt, as perhaps a preliminary step to the conquest of British India. Be that as it may, an expedition against Egypt was resolved on by the directory; and on May 19, 1798, Napoléon sailed from Toulon, with a fleet containing 30,000 soldiers and a body of savans to investigate the antiquities of the country. He reached Alexandria on June 29. At this moment France was at peace with Turkey; the invasion of Egypt, a Turkish dependency, was therefore an act utterly unjustifiable, and reminds us not of European warfare, but rather of the irruption of a horde of barbaric Tartars. Napoléon, having landed his troops, captured Alexandria and marched on Cairo. The Mamelukes prepared resistance; but on July 21, at the battle of the pyramids, they were completely defeated, and the French became, in a surface-way, masters of Egypt. Napoléon now entered the capital, and immediately commenced to reorganize the civil and military administration of the country; for he took a great, but also an ostentatious, pleasure in this sort of work. Meanwhile, on Aug. 2, Nelson had utterly destroyed the French fleet in Aboukir bay, and so cut off Napoléon from communication with Europe. A month later the sultan declared war against him. This was followed by disturbances in Cairo, which were only suppressed by horrible massacres. It was obviously necessary that Napoléon should go somewhere else. He resolved to meet the Turkish forces assembling in Syria; and in Feb., 1799, crossed the desert at the head of 10,000 men, stormed Jaffa on Mar. 7 after a heroic resistance on the part of the Turks, marched northwards by the coast, and reached Acre on the 17th. Here his career of victory was stopped. All his efforts to capture Acre were foiled through the desperate and obstinate valor of old Djezzar Pasha (q.v.), assisted by sir Sydney Smith with a small body of English sailors and marines. On May 21 he commenced his retreat to Egypt, leaving the whole country on fire behind him, and re-entered Cairo on June 14. It was during his absence that the savans made their valuable researches among the monuments of upper Egypt. About the middle of July the sultan landed a force of 18,000 men at Aboukir, who were attacked by Napoléon on the 25th, and routed with immense slaughter. But the position of the victor was far from comfortable, and he therefore resolved to return to France—especially as news had come to him of disasters in Italy and confusions in Paris. On Aug. 23 he sailed from Alexandria, leaving his army behind him under the command of Kleber; and after narrowly escaping capture by the English fleet, landed near Frejus on Oct. 9. He hastened to Paris, soon mastered the state of affairs, threw himself into the party of Sieyès, and overthrew the directory (q.v.) on the famous 18th Brumaire. A new constitution was drawn up, chiefly by Sieyès, under which Napoléon became first consul, with the power of appointing to all public offices, of proposing all public measures in peace or war, and the entire command of all administrative affairs civil and military. In a word, he was ruler of France; and though far from satisfied with the clumsy machinery of Sieyès's plan, he could afford to wait the future. About the end of Jan., 1800, he took up his residence in the Tuileries. The country was tired of revolutions, discords, and confusions; it was proud of its young leader, who seemed inspired but not enslaved by the ideas of his age, and who knew how to enforce obedience as well as to panegyrize principles. It therefore regarded his assumption of sovereign power with positive satisfaction. Napoléon displayed extraordinary vigor as an administrator, recruited the national treasury by various sagacious expedients, repealed the more violent laws passed during the revolution, such as punishment for matters of opinion, reopened the churches, and terminated by policy the Vendean struggle. But he knew well that his genius was essentially military, and that his most dazzling and influential triumphs were those won on the battle-field. France was still at war with Austria, and he resolved to renew the glories of his first Italian campaigns. Leaving Moreau in command of the army of the Rhine, he assembled, with wonderful rapidity and secrecy, an army of 36,000 men on the shores of the lake of Geneva, and on May 13 (1800) began his magnificent and daring march across the Alps. Almost before the Austrian general, Melas, was aware, Napoléon had entered Milan (June 2). Twelve days afterwards was fought the fiercely contested yet decisive battle of Marengo, which compelled the Austrians to resign Piedmont, with all its fortresses, and (for the second time) Lombardy to the French. Later in the year hostilities were recommenced; but the Austrians, beaten by Moreau in Germany (at Hohenlinden, etc.) and by Napoléon in Italy, were at last forced to make peace; and on Feb. 9, 1801, signed the treaty of Lunéville, which was mainly based on that of Campo Formio. In the course of the same year France and England also made peace; but the treaty (known as that of Amiens) was not definitively signed till Mar. 27, 1802. Not less important for the consolidation of affairs in France was the famous *concordat* (q.v.) between Napoleon and Pope Pius VII., also concluded in 1801. In Jan., 1802, Napoléon became president of the Cisalpine republic; and on Aug. 2 following was declared consul for life by a decree of the French senate.

Meanwhile Napoléon was busy superintending the drawing up of a code of civil laws for France. He assembled the first lawyers in the nation, under the presidency of Cambrérès, and frequently took part in their deliberations; the results of their labors were the *code civil des Français*, *code de procédure*, *code penal*, and *code d'instruction criminelle*, besides commercial and military codes, all of which often go loosely under the name of the *code Napoléon*. The first of these is an admirable production, and is in force to the present day. Considerable attention was besides paid to such branches of education as were likely to promote efficiency in the public service. Mathematics, physical science in all its departments, engineering, etc., were as vigorously encouraged as philosophy, ethics, and political speculation were discouraged. But the best proof that Napoléon wanted not an educated people, but only active and expert tools and agents, was the indifference that he manifested to primary and elementary education. In a population of 32,000,000, the number of pupils under 10 years is given by Fourcroy at only 75,000. The internal government was the acme of despotic centralization. Napoleon appointed all prefects of departments and all mayors of cities, so that not a vestige of provincial or municipal freedom remained. He ruled France as he ruled the army of France, and was already an emperor in almost everything but the name.

Peace between France and England did not last long. Napoléon's policy in Italy irritated the British government, and, as remonstrances were ineffectual, war was declared against France May 18, 1803. The English fleet scoured the seas, paralyzing the commerce of France; while Napoleon threatened to invade England, and assembled a large army at Boulogne. So utterly did he misconceive the character and condition of Englishmen that he felt sure (by his own statement) he should be welcomed as a liberator by the people. While these warlike preparations were going on occurred the dangerous conspiracy of the Chouan chief, George Cadoudal (q.v.), Pichegru (q.v.), Moreau (q.v.), and others. Its discovery (Feb., 1804) alarmed Napoléon excessively, and led to what has been considered one of the blackest deeds in his career—the murder of the duke d'Enghien (q.v.) on Mar. 20 following. He now appears to have felt it necessary to assume the title of emperor. France, he alleged, wanted an empire as a symbol of permanent security. An appeal was made to the nation. Upwards of 3,000,000 votes were given in favor of the proposed change in the form of government; only 3,000 or 4,000 against it. But where there is no municipal freedom, one does not know what value to put on votes. On May 18 Napoléon assumed the title of emperor at St. Cloud, and was crowned by, or rather in the presence of the pope (for Napoléon rudely crowned himself), on Dec. 2. In the following summer (May 26), he was also crowned king of Italy, in the great cathedral of Milan; and Eugène Beauharnais, his step-son, was appointed to the office of viceroy.

This policy of aggrandizement, which set at naught the conditions of the treaty of Lunéville, alarmed the other nations of Europe, especially Austria, who saw her Italian possessions seriously threatened. In 1805 a coalition was formed between England, Russia, Austria, and Sweden, mainly through the persevering policy of the first of these countries; and war again broke out in the month of September. Napoléon acted with amazing celerity. Concentrating his widely scattered forces at Mainz, he marched at once across Bavaria, compelled gen. Mack to capitulate at Ulm with 20,000 men (Oct. 17), and on Nov. 13 entered the capital of Austria. France was electrified; the rest of Europe was thunder-struck. But a more glorious triumph was yet to come. The Russian army was already in Moravia, under the immediate command of the emperor Alexander I., and was there being joined by the scattered Austrian troops. Napoléon did not lose a moment. Hurrying north, he gave battle to the allies at Austerlitz on Dec. 2. The contest was tremendous, but the victory was complete. Napoléon's opponents were utterly crushed; and next day the Austrian emperor sought an interview, and sued for peace. A treaty was signed at Presburg on Dec. 26, by which Austria ceded to France all her Italian and Adriatic provinces; other changes effected by it were, the dissolution of the old German empire and the formation of the *confederation of the Rhine* (q.v.).

In Feb., 1806, a French army conquered Naples, and the crown was conferred by Napoléon on his brother Joseph; in the following June another brother, Louis, was made king of Holland. Prussia now, when it was too late, assumed a hostile attitude. She had hung off, partly through fear and partly through selfishness, from the great anti-French coalition of the previous year, and now, when circumstances were almost hopelessly adverse, she madly rushed against her colossal enemy. Austria, with more magnanimity than prudence, lent her help, but the star of Napoléon was still in the ascendant. The battle of Jena (Oct. 14) absolutely annihilated the power of Prussia; five days later Napoléon entered Berlin, whence he issued (Nov. 21), his celebrated "decrees" against British commerce, hoping to ruin her by shutting out her ships from every harbor in Europe. His expectations, it need hardly be said, were disappointed. His policy well-nigh ruined the commerce of his own and other countries, but it only increased the prosperity of England. Her fleets and cruisers swept the seas; nothing could be got from the colonies save through her, and the merchants of the continent were obliged—in order to supply their customers as before—to let her carry on a vast contraband traffic. See ORDERS IN COUNCIL.

After the capture of Berlin, Napoléon proceeded northwards to encounter the Russians, who were advancing to the help of Prussia. On his way he summoned Poland to rise, but only with partial success. At Pultask (Dec. 18, 1806) and at Eylau (Feb. 8, 1807) the French were beaten and driven back on the line of the Vistula; but after some months he received heavy re-enforcements, and on June 13 fought and won the great battle of Friedland, which led to the treaty of Tilsit, signed on July 7. By a secret article of this treaty, Russia promised to close her ports to British vessels. It is important to observe here that, as the military triumphs of Napoléon increased, the civil and political liberties of his subjects diminished. Consequent on the treaty of Tilsit, a decree of the imperial senate abolished the tribunate—the only political body in France that preserved the semblance of national self-government. In August, Napoleon created his brother Jerome sovereign of Westphalia—having patched up a kingdom for him in his usual unscrupulous way—and soon after entered on a war with Portugal—the beginning of the great peninsular war. The occasion of the war was the refusal of the prince-regent of Portugal to carry out the Berlin decree in regard to British shipping. In Mar., 1808, occurred that extraordinary instance of trepanning at Bayonne by which the whole royal family of Spain fell into the hands of Napoléon; and in the following July his "dearly beloved brother" Joseph was ordered to exchange the throne of Naples for the "crowns of Spain and the Indies." His successor was the "handsome swordsman" (*beau sabreur*), Joachim Murat. Spain rose in insurrection, and an English force, under sir John Moore, was dispatched to its assistance. Napoléon invaded the country about the close of October, defeated the Spanish forces, and captured Madrid (Dec. 4). But his presence was urgently needed elsewhere, and he was forced to let Soult and other generals conduct the war in the peninsula. Austria, again irritated and alarmed at his aggressive policy, especially in Italy (where he had seized Tuscany and the states of the church), once more prepared for war, which broke out in the spring of 1809. Her army of Germany, commanded by the archduke Charles, was in splendid condition; but still fortune was adverse. Napoléon hurried into Bavaria, routed the archduke at Eckmühl (April 22), compelled him to retreat into Bohemia, and on May 12 entered Vienna for the second time. But the struggle was not over. The archduke rallied his scattered forces, worsted Napoléon in the terrible conflicts of Aspern and Essling (May 21 and 22), and drove him to take refuge for a time on an island of the Danube. The battle of Wagram (July 6), however, once more prostrated, or at least intimidated, Austria; and on Oct. 14 she signed the peace of Schönbrunn.

Napoléon appears to have now come to the conclusion that he could only put a stop to the hostile machinations of the old legitimate dynasties by intermarrying with some one of them. Besides, his wife Josephine had no children, and he was ambitious of perpetuating his power in his family. With that callousness to everything except his own interests, which is a prominent feature of his character, he immediately proceeded to divorce her. The act of divorcement was solemnly registered on Dec. 16. Less than three months afterwards he married Maria Louisa, archduchess of Austria. He was now at the zenith of his power, and so, according to the old Greek belief, Nemesis was on his track. What caused his ruin was really that outrage on civilization, the Berlin decrees. Russia found it impossible to carry it out, without permanent injury to her great landowners; Sweden and other countries were in a similar predicament. This led to evasions of the decree, and these, again, involved Russia particularly in further complications, until finally, in May, 1812, Napoléon declared war against her and, in spite of the advice of his most prudent counselors, resolved to invade the country. Every one knows the dreadful history of the Russian campaign. Napoléon—wringing contingents from all his allies, Germans, Austrians, Italians, Poles, and Swiss—concentrated between the Vistula and the Niemen an army of half a million of men. The vast horde crossed the latter river (June 24 and 25) in three divisions, captured Wilna (June 28), and ravaged Lithuania. The Russian generals retreated before the invading host, deliberately wasting the country and carrying off the supplies, but avoiding, as far as possible, all engagements; their design being to surround Napoléon in the heart of the country, and by the help of famine and the rigors of a northern winter to annihilate him in his hour of weakness. Napoléon followed up the retreating foe with reckless resolution. He risked everything upon the chance of striking some overwhelming blow. The horrors of his march—in Lithuania alone 100,000 dropped off (dead, sick, or captured by the swarms of Cossacks that hung upon his flanks)—are too familiar to require description. When he reached Smolensk (Aug. 16), the Russians had just left it—on fire. Three weeks or so later he made up on the enemy at Borodino, where an obstinate and bloody battle was fought (Sept 7). The French remained in possession of the field, but of nothing else. A week after Napoléon entered Moscow, hoping to find rest for a time in the ancient metropolis of the country. But the city was deserted by its inhabitants; and on the 16th a fire broke out, which raged till the 19th and left Moscow a heap of ruins. After five weeks' stay, Napoléon was obliged to commence his retreat (Oct. 19). His army was reduced to 120,000 men. The winter set in much earlier than usual, and he had to return through the very districts which had been wasted on his advance. When he left Smolensk (Nov. 14), he had only 40,000 fighting-men; when he crossed the Beresina (Nov. 26 and 27), he had not more than 25,000. With the excuse—which was in itself no doubt true—that his presence was urgently needed in France, he now abandoned the miserable remains of his army; and on Dec. 5, leaving Murat in command, set out in a sledge for Paris, where he arrived on the 18th of the same month. He instantly set about a fresh conscription; and in the spring of 1813 marched into Germany at the head of 350,000 men; but the Russian campaign had broken the spell of terror which his name had till then exercised. The spirit of all Europe was thoroughly roused. A conviction was, somewhat unconsciously, seizing every mind (at the close of the campaign of 1814 even France shared it) that the world had had "enough of Bonaparte" (*assez de Bonaparte*). Prussia, in particular, was burning to wipe out the disgrace of Jena and all the bitter humiliations to which she had been subsequently subjected. The victories of the British in Spain, the fame of which was spreading all over the continent, also proved to her that French soldiers *could* be beaten, not once or twice only, but through whole campaigns. An alliance was formed between the king of Prussia and the emperor Alexander. At first Austria remained neutral, but afterwards she joined the coalition. Napoléon's military genius, it has been often remarked, never showed to greater advantage than in this and the next campaign, which cost him his crown and his liberty. He was for some months successful in winning battles—at Lützen (May 2), Bautzen (May 21), and Dresden (Aug. 24, 25, and 27); but the invincible temper of the allies, who knew that he was playing his last card, made these victories almost fruitless. They were convinced that one grand defeat would neutralize all his triumphs. This was inflicted, after several minor defeats, at Leipzig—the great *battle of nations*, as it has been called (Oct. 16, 18, and 19). The result justified their expectations—Napoléon was hopelessly ruined! He commenced his retreat towards France, followed by the allies. When he recrossed the Rhine, he had only 70,000 or 80,000 men left out of his 350,000. All the French garrisons in the Prussian towns were compelled to surrender. Napoléon appeared at Paris Nov. 9; and though great discontent prevailed in the country, and a spirit of opposition showed itself even in the legislative body, the senate decreed, at his bidding, another conscription of 300,000 men, with which Napoléon began, in Jan., 1814, to attempt to drive the allies out of France. The skill and energy which he displayed were extraordinary, but they only marked the intensity of his despair. On Mar. 30 the allied forces captured, after a severe engagement, the fortifications of Paris; next day the emperor Alexander and the king of Prussia entered the city, *amid the shouts of the populace;* on April 4 Napoléon abdicated at Fontainebleau. He was allowed to retain the title of emperor, with the sovereignty of the island of Elba, and an income of 6,000,000 francs, to be paid by the French government. A British ship conveyed him to Elba, where he arrived on May 4.

After a lapse of ten months, most of which was spent in intrigues, Napoléon made his escape from the island, landed near Frejus on Mar. 1, 1815, and appealed again to France. The army went over to him in a body, and several of his marshals, but the majority remained faithful to Louis XVIII. On Mar. 20 he reached Paris, reassumed the supreme power, promised a liberal constitution, and prepared once more to try the fortune of battle with the allies. At the head of 125,000 men, he marched (June 15) towards Charleroi, on the Flemish frontier, where the English and Prussian forces were assembling. The duke of Wellington, who, the year before, had completed the deliverance of Spain, was appointed by the congress of Vienna commannder-in-chief of the armies of the Netherlands. The campaign lasted only a few days. On the 16th Napoléon defeated the Prussians, under marshal Blücher, at Ligny, which compelled Wellington to fall back on Waterloo, where, on the 18th, was fought the most memorable and decisive battle of modern times. It resulted in the utter and irretrievable ruin of Napoléon. The despot, who knew what awaited him—for France had *not* recalled him from Elba; he came at the desire of a faction, whose interests were identical with his—returned to Paris. The house of representatives fiercely insisted on his abdication. He did so (June 22) in favor of his son, Napoléon II.; they further demanded that he should leave the country forever, and he retired to Rochefort, with the design of embarking for the United States. On July 7 the allies again entered Paris, and refused to acknowledge the acts of the French provisional government. Napoléon, who saw that he could not escape either by sea or land, voluntarily surrendered (July 15) to capt. Maitland of the *Bellerophon*, claiming the protection of British laws. It was, however, resolved by the British government to confine him for life on the islet of St. Helena, a lonely rock in the southern Atlantic, 1000 miles from the coast of Africa. He was conveyed thither by admiral Cockburn, and landed at St. Helena Oct. 16, 1815. The remainder of his life was politically insignificant. His chronic quarrels with his governor—or *jailer*, as the French prefer it—sir Hudson Lowe; his conversations with friends and visitors about his past career; his deliberate attempts to falsify history in his writings, are familiar to every one. After more than a year of bad health, he expired, May 5, 1821. He was buried with military honors. In 1840 his remains were removed to France, and deposited in the *Hôtel des Invalides.*

NAPOLÉON II., son of Napoléon Bonaparte. See Reichstadt, Duke of.

NAPOLÉON III., nephew of Napoléon Bonaparte. See Louis Napoléon.

NAPOLÉON, or, in full, Napoléon Joseph Charles Paul Bonaparte, is the son of Jerome, king of Westphalia, and was b. at Trieste in 1822. When the insurrection broke out in the Romagna in 1831, he was staying in Rome with his grandmother, Mme. Letitia Bonaparte, but was forced to leave the city for Florence on account of his cousins (see Louis Napoléon) being implicated in the revolutionary disturbances. He was educated at a boarding-school in Geneva, and at the military school of Ludwigsburg, in Würtemberg, completing his studies in 1840, after which he traveled for five years in Germany, England, and Spain. In 1845 he obtained permission to visit Paris under the name of the comte de Montfort; but his relations with the democratic party and his advanced political opinions rendered him suspected by the government, who ordered him to quit the country. He, however, again made his appearance on the eve of the revolution of Feb., 1848. After the fall of Louis-Philippe he offered his services to the provisional government, and was elected by the Corsicans a member of the constituent assembly, where he voted with the moderate republicans. He held for a short time, in 1849, the office of minister-plenipotentiary at Madrid. After the *coup d'état* he withdrew into private life; but on the restoration of the empire he reappeared to share in the honors that now fell thickly on his family. By a decree of the senate, Dec. 23, 1853, he was pronounced a French prince, with the right to a place in the senate and the council of state; at the same time he received the insignia of the grand cross of the legion of honor, and—though he had not served—the rank of gen. of division. In the Crimean war he commanded a division of infantry reserves at the battles of Alma and

Inkerman, but soon after returned to France, on the plea of ill-health. Napoléon was president of the imperial commission of the Paris exhibition in 1855. In 1858 he was appointed head of the ministry for Algiers and the colonies, but held the office only for a short time. During the same year he married the princess Clotilde, daughter of Victor Emmanuel, and in the Italian war of 1859 commanded the French army of reserve in the south of Italy, but was not engaged in actual hostility. In 1861 he made a speech in the senate reflecting on the Orleans family, for which he was challenged by the duc d'Aumale. The challenge was not accepted, much to the disgust of the French army. Napoléon was president of the French commission at the London exhibition of 1862. In 1865 he resigned several public appointments, owing to a reprimand from the emperor about a speech. Afterwards, however, he was intrusted with many delicate missions, and urged the emperor to a liberal policy. In 1876 he was returned to the French assembly for Corsica, but in the election of 1877 was rejected. The death of the prince imperial in Zululand in 1879 gave Napoléon and his sons a more prominent position in the Bonaparte family.

NAPOLEON-VENDEE, BOURBON-VENDÉE, or LA ROCHE SUR YON, a t. of France, the capital of the department of Vendée, pleasantly situated on a hill on the right bank of the Yon, 37 m. s. from Nantes. The town has no manufactures and little trade, but derives its importance chiefly from its being the seat of departmental administration. The town contained only 800 inhabitants when Napoleon I. selected it for the capital of the department, granted great sums for its improvement, and called it *Napoleon-Vendée*, changed to *Bourbon-Vendée* at the restoration of the Bourbons, the former name coming again into use under Napoleon III. It is now known as *La Roche sur Yon*. Pop. '76, 9,021.

NA'POLI DI ROMANI'A. See NAUPLIA, *ante*.

NARA, the ancient capital of Japan during the reign of seven mikados, four of whom were women. This most interesting town lies 20 m. e. of Ozaka, and contains a pop. of 21,000—one-tenth of its former number. From 708 to 782 Nara was the national seat of art, letters, religion, and government, being visited by envoys from China, Siam, India, and Corea. Libraries, monasteries, and temples flourished. Among the relics of the past extant are the monster bell, 13½ ft. high, 9 ft. in diameter, 8 in. in thickness, and weighing 36 tons; and the colossal gilded bronze image of Buddha. 53 ft. high. The industries of Nara in the manufacture of fans, silk, lacquer, cloisonné enamel or porcelain, etc., are still famous. Mikasa Yama (the hill of the three hats), near by, is a natural feature, famous in native poetry and art, being frequently depicted on fans, cabinets and scroll paintings.

NARAKA is the hell of the Hindus. Manu (q.v.) enumerates 21 hells or divisions of Naraka, and gives a general description of the tortures which await the impious there. The Purânas, however, are more systematic. The Vishnu-Purâna, for instance, not only names 28 such hells, but distinctly assigns each of them to a particular class of sinners. Thus, a man who bears false witness is condemned to the hell *Raurava* (i.e., fearful); the murderer of a Brâhman, stealer of gold, or drinker of wine, goes to the hell *Sûkara* (i.e., swine), etc. Besides these twenty-eight which the Purâna knows by name, we are told of "hundreds and thousands of others in which sinners pay the penalty of their crimes."

NARBONNE, a t. in the s. of France, in the department of Aude, 55 m. s.w. of Montpellier, on a branch (La Robine) of the canal du Midi. It is the *Narbo Martius* of the Romans; but there is reason to believe that it was well known to the Greeks 500 years before the Christian era. It was colonized by the Romans 118 B.C., and probably got the designation Martius from Q. Marcius Rex. one of the consuls at the time. Situated only about 8 m. from the sea, on the direct road into Spain and into the basin of the Garonne, Narbonne was in early times a place of great commercial prosperity. It was the second settlement founded in south Gallia by the Romans, and was considered by them an important acquisition, both for its strength and as the key to the road into Spain. Under Tiberius it flourished greatly, the arts and sciences being cultivated with success, and its schools rivaling for a long time those of Rome. About 309 A.D. it became the capital of Gallia Narbonensis, and contained among other buildings a capitol, theater, forum, aqueducts, triumphal arches, etc. It was taken in 719 by the Saracens, who planted here a Moslem colony, and destroyed the churches. In 859 it fell to the arms of the Northmen. During the 11th and 12th centuries it was a flourishing manufacturing city, but subsequently it fell into comparative decay, and is now entirely destitute of any monument of its former splendor. A considerable number of architectural fragments—as capitals, marble slabs with inscriptions, friezes, etc.—have been found, and have been grouped into a collection of antiquities.

The present very dirty town contains one imposing building, the cathedral of St. Just, founded in 1271, but still unfinished. The honey of Narbonne is the best in France, both for color and flavor. Manufactures are carried on to some extent. Pop. '76, 18,825.

NARCIS'SUS, according to a Greek fable, was the son of the river god Cephissus and of the nymph Liriope or Liriœssa of Thespiæ, in Bœotia. He was a youth of extraordinary beauty, of which he was excessively vain; and for this he was punished by

Nemesis, by being made to fall in love with himself on seeing the reflection of his own face in a fountain. He died of this love-sickness; and on the place where he died sprung up the flower which bears his name. The story of Narcissus, finely narrated by Ovid, is of comparatively late origin.

NARCISSUS, a genus of plants of the natural order *amaryllideæ*, having a perianth of six equal petal-like segments, and a bell-shaped corona of various magnitude. The species are natives of the s. of Europe, the n. of Africa, and the temperate parts of Asia. The common daffodil (q.v.) is the only one which can be regarded as truly a native of Britain. Many are cultivated in gardens for the sake of their beautiful and often fragrant flowers, which in general appear early in the season. Some of them are known by the names of daffodil (q.v.) and jonquil (q.v.). The name narcissus is popularly restricted to those which have flat—not rush-like—leaves, and a short, not bell-shaped corona. Of these, one of the best known is the poet's narcissus (*N. poeticus*), with generally one-flowered scape, the flower white and fragrant, the corona with a deeply-colored border; others, with one or two flowers on the scape, are in common cultivation.—The POLYANTHUS NARCISSUS (*N. Tazetta*) has a number of flowers on the scape. It grows wild in stony places near the Mediterranean and eastwards to China. Many varieties of it are in cultivation. It is not only grown in gardens and green-houses, but in water-glasses, like the hyacinth. It is very common in gardens in India, where it is highly esteemed as a flower. The narcissi in general are propagated either by seed, or by offset bulbs. They succeed best in a rich light soil.

NARCOT'ICS (Gr. *narkē*, stupor) are remedies which, in moderate doses, lessen the action of the nervous system. Their full operation is sleep or coma. Opium is the type from which most descriptions of this class of medicines have been drawn; but although most narcotics more or less resemble opium in their action, almost every one presents some peculiarity in the way in which it affects the system. These medicines are primarily stimulating, especially when given in small or moderate doses; but this stage of their action is comparatively short; and when the dose is large the excitement is scarcely perceptible. Their power of inducing sleep has procured for them the names of hypnotics and soporifics; while many of them are termed anodynes, from their possessing the property of alleviating pain. Next to opium, henbane, Indian hemp, and aconite may be regarded as the most important narcotics. It has been already mentioned that there are differences in the mode of operation of the different members of this class. "Some dilate, while others contract the pupil; some appear to concentrate their sedative action more particularly upon the functions of the encephalon, others upon the contractile power of the alimentary and bronchial tubes, while a strict distinction is to be drawn between those which occasion constipation and those which do not; all these things being of great practical importance."—Ballard and Garrod's *Elements of Materia Medica*, p. 13.

Narcotics are usually administered either with the view of inducing sleep or of alleviating pain or spasm. As, however, their action is much modified by a variety of circumstances—such as age, idiosyncrasy, and prolonged use—they should be administered with extreme caution; and, as a general rule, only under competent advice. The various quack medicines for children which are known as *carminatives*, *soothing syrups*, etc., contain some form of opium, and are a fertile cause of the great mortality that occurs in early life, especially among the poorer classes.

It is almost unnecessary to add that all the narcotics when taken in excess are poisonous.

NARCOTINE ($C_{46}H_{25}NO_{14}+2Aq$) is one of the organic bases or alkaloids occurring in opium, in which it usually exists in the proportion of 6 or 8 per cent. It is nearly insoluble in water, but dissolves readily in alcohol, ether, and chloroform. Its ethereal solution, when submitted to spontaneous evaporation, yields it crystallized in colorless acicular groups or in rhombic prisms. A mixture of concentrated sulphuric and nitric acids produces a blood-red color with narcotine and its compounds. Narcotine possesses very slight alkaline properties; its salts do not readily crystallize, and are even more bitter than those of morphia, although the substance itself is almost tasteless. When first discovered (in 1803), it was supposed to be the stimulant principle of opium; but in reality it possesses very little activity. It has been prescribed in gradually increased doses up to a scruple, without the least injury. Its sulphate has been used in India as a substitute for quinine; and nearly 200 cases of intermittent and remittent fevers, treated by it with success, have been published by Dr. O'Shaughnessy.

NARD AND NARDOS'TACHYS. See SPIKENARD.

NAR'DO (anc. *Neretum*), a t. of South Italy, in the province of Lecce, 8 m. n.n.e. from Gallipoli. Nardo has manufactures of cotton goods and snuff, from cotton and tobacco grown in the neighborhood. The surrounding country abounds in olive plantations. Pop. about 8,500.

NARDOO, *Marsilea quadrifida*, a plant of the acotyledonous natural order *marsileaceæ* (q.v.), the only plant of that order which is used in any way by man. It has but recently become known to botanists. It is found in Australia, and affords important supplies of food to the natives of some regions; it has also been of great use to some recent exploring-parties. It grows in places occasionally covered with water; vegetating while moisture abounds, and then exhibiting abundance of green clover-like foliage, the leaves consisting of three leaflets at the top of a stalk some inches in length. When the water dries up the remains of the plants are often covered with dried mud. It is then that the spore-cases are gathered for food. They are oval, flattened, about an eighth of an inch in length, hard and horny, and requiring considerable force to pound them when dry, but becoming soft and mucilaginous when moistened. The spore-cases, pounded with their contents, are made into cakes like flour.

NAR'DUS, a genus of grasses, having a simple spike, spikelets all on one side, no glumes; each spikelet consisting of one floret, which has two paleæ, the outer ending in a long point. *N. stricta* is one of the most common of British grasses, growing in dry elevated situations, and very characteristic of them. It grows in tufts, and is often called Mat-grass. It is perennial, purplish, short, rigid, and very worthless, as almost no animal but the goat will eat it.

NARES, Edward, D.D., 1762–1841; b. England; son of sir George Nares and cousin of Robert Nares; was educated at Christ church, Oxford, and became a fellow of Merton college in 1788. Ten years later he became rector of Biddenden, in Kent; and in 1814 regius professor of modern history at Oxford. He wrote, among numerous works: *On the Plurality of Worlds; Discourses on the Three Creeds; Evidences of Christianity; Elements of General History; Heraldic Anomalies; Memoirs of the Life and Administration of William Cecil, Lord Burghley;* and a novel entitled *Thinks I to Myself*, which passed through several editions in 1811.

NARES, James, 1715–83; b. Stanwell, Middlesex, England; studied music under Bernard Gates and the famous Dr. Pepusch at King's chapel, London. In his nineteenth year he became organist of the York cathedral. He published *Lessons for the Harpsichord* in 1748; was made doctor of music at Cambridge in 1755; was appointed organist to George II., and removed to London in 1756; was made master of choristers in 1757, and resigned the position in 1780. He published *Catches, Canons, and Glees*, dedicated to the earl of Mornington, 1778; also his *Twenty Anthems in Score*, which still continue in use. His works show a thorough knowledge of the science of music.

NARES, Robert, 1753–1829; b. England; son of James Nares, an organist and musical composer, studied at Oxford; in 1778 took orders, and soon became rector of Sharnford, Leicestershire, and preacher at Lincoln's Inn. As critic, essayist, and theologian he held a high rank among the writers of his time; was archdeacon of Stafford 1799, rector of St. Mary's, Reading, canon of Lichfield, and for sometime rector of Allhallows church, London. Associated with the rev. William Beloe he founded the *British Critic*, which he assisted in conducting for four years as a high-church literary review, conservative in principle, and opposed to the dogmas of the sympathizers with the French revolution. He was at one time assistant librarian of the British museum. He was a contributor to the *Classical Journal*, and published, in 1784, *Elements of Orthoepy*, and in 1805, *Chronological View of the Prophecies relating to the Christian Church*. One of his most important works is *A Glossary of Words, Phrases etc., in the Works of English Authors of the Age of Queen Elizabeth*, new edition 1861. In 1815 he published the *Veracity of the Evangelists Demonstrated*. In 1823 he was vice-president of the royal society.

NA'REW, a river of w. Russia, an affluent of the Bug, rises in the government of Grodno, and flows w.s.w to the main stream, which it joins at Sicrock, after a course of 294 miles. The waters of the Narew are about as great in volume as those of the Bug. It is navigable to Tykoczin, 150 m. from its mouth.

NARNI, a t. of the province of Perugia, Italy, about 45 m. n.e. of Rome, 8 m. from the city of Ferni; situated on a precipitous hill on the left bank of the Nar. The Romans colonized the place and gave it the name of Narnia about 300 B.C., and it was a military post on the Flaminian way. Ruins of a massive marble bridge built by Augustus and of a very ancient aqueduct are still to be seen. Narni has been the seat of a bishopric since 360, and the cathedral dates from the 13th c.; the only other buildings of interest are the castle and convents. In the 9th c. the town was seized by the duke of Spoleto, and in the middle ages was burned and laid waste. Pope John XVIII. and the emperor Nerva, 98 A.D., were natives of Narni.

NA'RO, a t. of Sicily, in the province of Girgenti, and 14 m. e. of the town of that name. It has 10,253 inhabitants, who trade in oil, wine, and sulphur. Numerous tombs, medals, and other antiquities have been found here.

NARRAGANSETT BAY, an inlet of the Atlantic ocean, e. of Kent and Washington counties, R. I., extending n. 28 m. to Bullock's Point, 6 m. from Providence, and w. from Seconnet to Point Judith, 12 m., and with a width never less than 2 miles. The Pawtucket, Pawtuxet, Providence, and Taunton rivers empty into it, and it contains a number of islands, of which Rhode Island, Providence, and Canonicut are the most important. Newport is at its s. extremity; Bristol and Warren are on its shores. It is navigable by large vessels to Providence. The n. part is called Providence bay.

NARRAGANSETT PIER, a village in s. Rhode Island, in the township of South Kingston, Washington co.; pop. '70, 301. It is 7 m. e. of Kingston, the county-seat, about 26 m. s. of Providence, and 8 m. s.w. of Newport; delightfully situated on the w. shore, near the mouth of Narragansett bay, and has an excellent beach. It is a popular summer resort. Excellent facilities for fishing and boating are amply provided, and it is celebrated for its fine drives and scenery. It has a number of elegant private summer residences, and 6 or more hotels. Three miles from the pier are Narragansett heights, 400 ft. above the bay, commanding a magnificent view, and on the rising ground near the most fashionable hotel is Silver lake, a beautiful sheet of water embowered in trees. A line of horse-cars connects the heights with the beach. Steamboats run between Providence and this place, and a newspaper is published here.

NARRAGANSETTS, a tribe of Indians that inhabited Rhode Island and the western shore of Narragansett bay; after whom the latter was named. They were originally a part of, and spoke the dialect of the Algonquins. They were friendly towards the colonists, their wars being waged generally against other Indian tribes. Canonicus, their chief sachem, warmly befriended Roger Williams, and gave him a large tract of land. In 1636 king Philip, chief of the Pequots, sought alliance with the Narragansetts, which Roger Williams prevented by appearing, at the risk of his life, in the camp of the latter while the Pequots were there. Canonicus died in 1647. In 1675 the Pequots sent their women and children to the Narragansetts for protection, while they attacked the people of Swanzey. The people of Boston and Plymouth at this time extorted a treaty of peace from Canonchet, the last chief of the powerful Narragansetts. King Philip, having spread havoc through the valley of the Connecticut, returned to Rhode Island, when the Narragansetts joined him, violating their treaty. The colonists, to punish the Indians for their treachery, attacked them in an immense swamp in the southern part of Rhode Island, where several tribes, including the Narragansetts, had built their wigwams and gathered together their families and supplies for the winter, their fort being on an island in the swamp. The whites burned 500 of their wigwams, and their provisions, men, women, and children perishing in the flames. Canonchet was made prisoner and killed. After this war only a few of the Narragansetts were left; these intermarried with the colonists, and became civilized. A few of the tribe still remain in the region of Charlestown, R. I.

NARSES, a celebrated statesman and gen., and almost the last stay of the old Roman empire in Italy, was b. toward the last quarter of the 5th century. The place of his birth is uncertain. His parentage was obscure, and he was probably sold as a slave in childhood, having, according to the barbarous usage of the period, been previously emasculated. From some menial office in the imperial household at Constantinople, he rose by successive steps to the post of *cubicularius*, or private chamberlain of the emperor Justinian, and ultimately to that of keeper of the privy purse. In the difficult art of courtiership, Narses long maintained a pre-eminence. More remarkable, however, considering his condition, was the distinction which he attained in military affairs. In 538 he was sent to Italy in command of a body of troops, professedly to act in concert with Belisarius (q.v.); but in reality, it is conjectured, with a secret commission to observe and control that general. After some successes, Narses, having disputed with Belisarius, assumed an independent authority; but his separate command was unfortunate, and he was recalled to Constantinople in 539. After some years, however, Belisarius was recalled, and Narses was appointed to the chief command in Italy. His conduct of that expedition extorted the admiration even of his enemies. Not having the command of a sufficient number of transports, he marched his army along the whole circuit of the shore of the Adriatic, and while the enemy's fleet were still in possession of the sea, was enabled to encounter them in the plain of Sentaglio, near Tagina, where, after a desperate engagement, the Goths were totally defeated, and their king, Totila, slain. Narses took possession of Rome, and after a series of successes both in southern and northern Italy, completely extinguished the Gothic power in that peninsula. Justinian appointed Narses exarch of Italy in 553. He fixed his court at Ravenna, and continued, till the death of Justinian, to administer the affairs of Italy with a vigor and ability which did much to stay the progress of that decay which had long infected all its social, political, and military institutions. The only blot on the character of his administration is the avarice with which he is charged by his contemporaries. His exactions pressed heavily on the exhausted resources of the population; though their severity may be in some degree palliated by the splendor and utility of the public works on which he partly expended the public resources. On the death of Justinian, his ascendency came to an end. The Romans, on the accession of Justin, complained to him of the exactions of Narses, and that emperor deprived him, in 565, of his office; a proceeding to which a special indignity was imparted by an insulting message from the empress, that it was time for him to "leave arms to men, and to spin wool among the women of the palace." To this bitter taunt (according to Paulus Diaconus, *De Gest. Long.* ii. 6), Narses replied that he would "spin for her a thread which she would find it hard to unravel;" and he is accused of secretly intriguing with Alboin, king of the Lombards, to incite a new invasion of Italy, at the same time submissively offering his services to the emperor for the purpose of repelling the invasion. This account, however, seems uncertain, and perhaps improbable; and as Narses died at Rome in 568, just on the eve of the Lombard invasion, no light is thrown upon this story by the actual events of the war. His age at the time of his death is a subject of much curious controversy. According to the popular account, it was no less than 95 years; but this is doubted by most of the historians.

NAR'THEX, a part of the early Christian churches separate from the rest by a railing or screen, and to which the catechumens and penitents were admitted.

NARUSZE'WICZ, Adam Stanislaf, 1733-96; b. Lithuania. After completing his studies at the university of Vilna, in 1748, he entered the order of Jesuits, traveled through Germany, France, and Italy, and on his return became director of the Jesuit college of Warsaw, and a friend of king Stanislaf-August. Upon the suppression of his order he was appointed coadjutor to the bishop of Smolensk in 1788, secretary of the council, and finally bishop of Lutsk. After the death of the king he resided in Janovisc (Gallicia), where he died. His chief work is the *History of the Polish Nation*, in 10 vols., which gained for him the title of the Polish Tacitus. He published also an excellent translation of Tacitus, a *History of the Crim-Tartars;* a *Life of Khodkiévitch Hetman of Lithuania;* and 4 vols., of poems, odes, satires, fables, etc.

NARVA, a Russian t. in the gov., and 95 m. w.s.w. of St. Petersburg, is situated on the Narova, 10 m. from its mouth in the gulf of Finland. It was founded in 1238 by Waldemar II., king of Denmark, and came into the possession of Russia in 1704. The navigation of the Narova is impeded by a waterfall near Narva, 14 ft. high. In 1878 168 ships, of 18,175 lasts (1 last=1¼ ton), entered the port; the exports, chiefly flax and timber, were £150,693; the imports £402,840. At the waterfall above the town there are sawmills, and an extensive cotton-mill which employs 1700 workmen. Though belonging to the government of St. Petersburg, Narva is ruled by the laws of the Baltic provinces. Here, in November, 1700, Charles XII., with 8,000 men, defeated a Russian army of 60,000 men, under Peter the great and the duke of Croy. Pop. '67, 6,175.

NARVAEZ, Pamfilo de, 1480-1528; b. Spain; sailed for the West Indies not long after the discoveries of Columbus. In 1501 he was in Santo Domingo, in the conquest of which, as also of Jamaica and Cuba, he participated; and in the reduction of the latter he was second to Velasquez, the governor, in command of the Spanish forces. In 1520 Velasquez sent him on an expedition to Mexico to bring Cortes to submission, and with orders to arrest him and take his place in the government of the country. But Cortes fell upon him at Zempoalla, and took him prisoner; and Narvaez lost an eye in the battle. He was imprisoned by Cortes for five years; but his adherents joined the army of Cortes and took part with it in the battles which resulted in the conquest of Mexico. On his liberation Narvaez returned to Spain, and attempted in vain to induce the government to punish Cortes. He succeeded, however, in obtaining an extensive grant of land in America, and arrived at Tampa bay in 1528 with a force of 400 men whom he intended to settle somewhere in Florida. He went on to Appalachee, but was met everywhere by the bitter hostility of the natives; and the country, contrary to his expectations was sparsely settled and poor. He reached the sea-coast, and attempted to go to Mexico in boats; near the mouth of the Mississippi his boat was sunk, and he was drowned. Only a few of his companions, after suffering great hardships for nearly 8 years, succeeded in reaching Sonora, whence they went to Mexico.

NARVAEZ, Don Ramon Maria, Duke of Valencia, a Spanish general and statesman, was b. at Loja, in Andalusia, Aug. 4, 1805, and when very young served in the war of liberation against the French. He was an officer in 1820, when constitutional government was re-established in Spain; and in 1822, when a reactionary party of the royal guard took up arms to destroy the work of the revolution, Narvaez ranged himself on the side of the liberals, and contributed by his courage to the repression of the mutiny. Shortly after, under the command of Mina, he made the campaign of Catalũna against the guerrillas, who were assisted by the monks. The invasion of Spain by a French army in 1823 forced him to retire from active life. He withdrew to Loja, and lived there in obscurity until the death of Ferdinand VII. in 1832. In 1834, as capt. of chasseurs, he maintained a hot struggle against the Carlists of the Basque provinces, and signalized himself in various engagements. In 1836 he commanded a division under the orders of Espartero, and in November of that year completely routed the Carlist leader Gomez, near Arcos. This was a decisive moment in his career. He now became immensely popular, aspired to the highest offices of the state, and was regarded as the rival of Espartero. In 1838, by acts of terrible severity, he cleared the district of La Mancha of brigands, and was appointed in 1840 capt.gen. of Old Castile, and general-in-chief of the army of reserve. When Espartero gave gen. Alaix a place in the ministry, Narvez resigned his command. He took part in the insurrection against Espartero that broke out at Seville in 1840, but that having failed, he was compelled to flee to France, where he was shortly after joined by queen Christina (see Maria Christina), and commenced those plots against the government of Espartero which, in 1843, effected its overthrow. In 1844 he was appointed president of council and created duke of Valencia. His ministry was thoroughly reactionary. He recalled Maria Christina, and revised the liberal constitution of 1837. The progressista party was dissatisfied, and petty insurrections broke out, which the rigorous soldier-statesman repressed with an iron hand. But his dictatorial manners finally alienated even his personal friends, and his ministry was overthrown (Feb. 10, 1846). After a brief exile as special ambassador at the French court he returned to power in 1847, but soon afterwards quarreled with queen Christina, and found it necessary again to retire from office in 1851. In 1856, on the overthrow of O'Donnell's ministry, he again became president of council, and immediately commenced to strengthen the royal authority and to restrict the liberty of the press. The intrigues of the court compelled his resignation in 1857. He returned to power in 1864, and (1865) was succeeded by O'Donnell, with whom he suppressed, in 1866, a military revolt in Madrid. He replaced O'Donnell in the same year, and, despite the efforts of O'Donnell and Prim, retained power till his death in 1868.

NARWHAL, *Monodon,* or *narwhalus,* a genus of *cetacea,* of the family *delphinidæ,* resembling *beluga* (q.v.) in form and in the want of a dorsal fin, but remarkably characterized by having no teeth at all, except two in the upper jaw, supposed to be canines, which sometimes remain quite rudimentary, even in the mature animal, as they are in the young, and are sometimes developed into great spirally twisted straight tusks, passing through the upper lip, and projecting like horns in front. Only one species is ascertained, *M. monoceros* or *N. vulgaris;* the other species which have been described by naturalists having been founded on exaggerations and untrustworthy observations. It inhabits the Arctic seas, and is very rarely found so far south as the Shetland isles, although an accidental wanderer has reached the coast of England. Narwhals are often seen in great numbers among the ice-fields, and in the creeks and bays of the most northern coasts. They commonly associate in small herds. The tusks are much more frequently developed in the male than in the female, but in the female also they sometimes attain a large size. It is but rarely that both tusks are largely developed, although they sometimes are so, and then diverge a little; one of them generally continues rudimentary, or attains a length only of a few inches, whilst the other becomes a great horn, projecting straight in front, from which the animal has received the name of SEA UNICORN. A mature narwhal is generally about 15 or 16 ft. in length, without reckoning the tusk, which is from 6 to 10 ft. long. The body is less thick than that of the beluga; the head is small, the forehead rises abruptly, the muzzle is very obtuse, the upper jaw projects a little; the first half of the body is nearly cylindrical, the remainder to the tail fin is conical. The tusk is hollow nearly to the point. Its use is rather conjectured than known. It is probably a weapon of defense, but Scoresby has suggested that it may be also used for breaking thin ice in order to obtain opportunity for respiration; and for killing fish, as he found remains of skates and other flat-fish in the stomach of a narwhal, which it is not easy to imagine how a toothless animal, with rather small mouth and lips, could capture and swallow, unless the formidable tusk were first employed. Cephalopodous mollusks, however, are believed to constitute a principal part of the food of narwhals. The narwhal is a very active animal, swimming with great rapidity, lively, and playful. A group of narwhals playing together, projecting their great horns from the sea, and crossing them in their sport, is a very interesting sight. The narwhal is pursued by the Greenlanders and other inhabitants of the north, for the sake of its blubber, with which its whole body is invested to the thickness of about 3 in., amounting to nearly half a ton in weight, and yielding a large proportion of excellent oil. The tusks are also valuable, being of an extremely compact white substance—denser, harder, and whiter than ivory—which is used as a substitute for ivory. The kings of Denmark have long possessed a magnificent throne of this material, which is preserved in the castle of Rosenberg. The flesh of the narwhal is used by the Greenlanders as food. Great medicinal virtues were formerly ascribed to the tusks, but were merely imaginary.

NASA'LIS, or PROBOSCIS MONKEY, *Nasalis larvatus;* a monkey allied to the *doucs* or *semnopitheci,* but distinguished from all other monkeys by an extreme elongation of nose, that organ being nearly 4 in. in length in the mature animal. In the young the nose is comparatively undeveloped. The nostrils are placed quite at the extremity of the nose, and are separated merely by a thin cartilage. Of what use the magnitude of its nose is to the animal is unknown. The nasalis inhabits Borneo and neighboring islands. It is gregarious. It is an animal of about 3 ft. in height if placed erect a position it does not often assume. It can leap 15 ft. or more. Its fur is thick, not long, nor woolly; chestnut red, and in some parts golden yellow.

NASCAPEES', or NASCAPIS, a tribe of Indians inhabiting Labrador, of the Algonkin family, of whom very little is known, as missionary effort has had small influence among them, and there has been little other opportunity offered for investigating their history or their manners and customs. No linguistic works concerning them have been published, though grammars of their language are said to be in existence in manuscript. The number of the Nascapees was estimated in 1870 to be about 2,860.

NAS'CENT STATE, in chemistry. When an element or compound is liberated from some chemical combination in which it had previously existed, the element or compound so liberated is at the moment when it escapes said to be in a nascent state; and it is *then* often capable of exerting far more powerful combining action with other bodies than it can exhibit when brought in contact with them *after* it has been liberated. Arsenic and hydrogen will not directly combine if brought in contact with one another under ordinary circumstances, but the application of Marsh's test (see ARSENIC) depends upon the direct union of the nascent hydrogen (liberated by the decomposition of the water) with the arsenic, giving rise to arseniureted hydrogen gas. Again, if hydrated protoxide of nickel (NiO,HO) be suspended in a solution of caustic potash (KO,HO), it will undergo no change if a current of oxygen gas be passed through the solution; but if a current of chlorine be substituted for the oxygen, the whole of the metallic protoxide will be converted into the brown sesquioxide (Ni_2O_3), the resulting decomposition being shown in the equation:

$$\overbrace{2(NiO,HO)}^{\text{Protoxide of Nickel.}} + \overbrace{KO,HO}^{\text{Solution of Potash.}} + Cl = \overbrace{Ni_2O_3,3HO}^{\text{Hydrated Sesquioxide of Nickel.}} + \overbrace{KCl}^{\text{Chloride of Potassium.}}$$

This change arises from the action of the chlorine upon the potash, during which chloride of potassium (KCl) is formed, while the nascent oxygen which is liberated from the potash combines with the oxide of nickel. Again, cyanogen (C_2N) and chlorine do not enter directly into combination, but if cyanogen at the instant that it is liberated from one of its compounds (as, for example, cyanide of mercury) comes in contact with chlorine, the two combine; and many other examples of similar action might be adduced.

NASEBY, a parish and village of England, in the county of Northampton, 12 m. n. of the town of that name. Pop. '71, 693. The battle of Naseby, between Charles I. and the parliamentary army under Fairfax and Cromwell, took place here, June 14, 1645. It resulted in the total defeat of the royalists, the king being compelled to flee, after losing his cannon and baggage, and nearly 5,000 of his army as prisoners.

NASH, a co. in n.e. North Carolina, bounded on the n. by Swift creek, on the s.w. by Conteutny creek, and drained by Tar river; 500 sq.m.; pop. '80, 17,731—17,718 of American birth, 8,318 colored. The surface is irregular and heavily wooded. The principal productions are Indian corn, cotton, sweet-potatoes, wheat, and oats. Co. seat, Nashville.

NASH, Abner, 1730–86; b. Va., brother of gen. Francis; when very young removed from Prince Edward co. to Newbern, N. C., where he studied law, entered at the bar, and continued a successful practice for many years. He was a member of the provincial congress in August, 1774, and of the council in 1775. In 1776 he was a member of the commission which framed the state constitution of Virginia, and was elected to the house of commons session of 1777–78. In 1779 he was elected president of the senate, and governor of the state in 1780, resigning in the following spring. He married for his first wife the widow of governor Arthur Dobbs. In 1782 he was again elected to the assembly and was sent by that body as delegate to congress 1782–84 and 1785–86.

NASH, Francis, b. Va.; settled in Orange co., N. C.; was clerk of the superior court of the county before the revolution; was a member of the provincial convention of 1775, by which he was appointed lieut.col.; in 1777 was made brig.gen. by the continental congress; commanded a brigade at Brandywine and Germantown. At the latter place he was mortally wounded, and died at Kalpsville, Penn., Oct. 17, 1777. A monument was erected by the citizens of Germantown and Norristown.

NASH, John, an architect, was b. in London in 1752. He underwent the usual course of training for his profession, but soon entered into some building speculations which enabled him to buy a small property in Caermarthen. Here in fresh speculations he lost much money; therefore, in 1792, returned to London and architecture, in which he speedily rose to eminence. On the strength of having obtained a patent in 1797 for improvements in the construction of the arches and piers of bridges, he was in the habit of claiming a great part of the credit of introducing the use of cast-iron girders. A large part of his time was occupied in designing and constructing mansion-houses for the nobility and gentry in England and Ireland, but he is chiefly celebrated in connection with the great street improvements in London. From Feb., 1815, when he was appointed "architect, valuer, and agent to the board of woods and forests," down till near the end of his professional career, he was busily engaged in the planning of routes, grouping of buildings, and fixing of sites. Regent street, Haymarket theater, Langham place church, and the terraces in Regent's park are specimens of his designs. The pavilion at Brighton was another of his works. He retired from his profession in 1834, and died May 13, 1835. Nash, notwithstanding his many defects, possessed great power of effective grouping, as is well shown in his works. In the architecture of mansion-houses the designing of "interiors" was his *forte*.

NASH, Joseph, b. in England 1812; began his career as an artist in 1835 by exhibiting drawings of French cathedrals and other ancient buildings. He soon acquired high rank as a painter in water-colors and has made a specialty of illustrating old English architecture and domestic interiors. He has published two series of these illustrations, *Architecture of the Middle Ages* (1838), and *Mansions of England in the Olden Time* (1839–49). He has also produced historical paintings in water colors, such as "Charles V. visiting Francis I. during his Confinement;" "Queen Catherine, Campeius, and Ladies:" and "The Queen's Visit to Lincoln Hall" (1846). In 1878 an annual pension was bestowed upon him in recognition of his services to art.

NASH, Richard, better known by the name of *Beau Nash*, a fashionable character of the last century, who attained to a very remarkable notoriety, was the son of a Welsh gentleman, and was born at Swansea, in Glamorganshire, Oct. 18, 1674. After studying at Oxford, he held for some time a commission in the army, and subsequently took rooms in the Temple, but the dissipations of society had more attraction for him than the pursuits of law. He became a diner-out, a frequenter of good society, and contrived to support himself by gambling. But the grand turning-point in his fortunes was his visit in 1704 to Bath—then a favorite haunt of elegant invalids, and the scene of the gayest intrigues. Nash undertook the management of the public balls, which he conducted with a splendor and decency never before witnessed. In this way he came to acquire an imperial influence in the fashionable society of the place. It appears that he was also distinguished by a species of sentimental benevolence. He played hard and successfully; yet if he heard an individual sighing behind his chair, "Good Heavens! how happy would that money make me," Nash would thrust his own winnings into his hands, with theatrical generosity, and exclaim: "Go, and be happy." His own equipage at this period of his career was sumptuous. He used, we are told, to travel to Tunbridge in a post-chariot and six grays, with outriders, footmen, French-horns, and every other appendage of expensive parade. He is praised for the great care which he took of the morals of the young ladies who attended the Bath balls, always putting them on their guard against needy adventurers—like himself. In his old age, Beau Nash sank into poverty, and often felt the want of that charity which he himself had never refused. He died at Bath, Feb. 3, 1761, at the age of 87.

NASH, Thomas, 1564–1601; b. England; took a bachelor's degree at Cambridge, from which he was expelled for lampooning the college authorities. After a long tour on the continent he settled in London, and became a literary free lance. He began his career by some clever satires on the Puritans, whom he ridiculed in his *Pap with a Hatchet*, *An Almond for a Parrot*, and *A Countercuffe to Martin Junior*. His powers of satire soon made him a favorite with the wits of the day. In 1590 he was associated with Marlow, in the composition of *The Tragedy of Queen Dido*, and two years later his comedy, called *Summer's Last Will and Testament*, was produced in the presence of queen Elizabeth. But witty as he was as a pamphleteer, he had little talent as a dramatist; his play fell flat, and, as writing for the stage was then the only remunerative field for an author, he was soon miserably poor. In his *Pierce Penilesse, his Supplication to the Divell*, he describes himself as "sitting up late and rising early, contending with the cold, and conversing with scarcitie;" and the same tone prevails in his *Christe's Tears over Jerusalem*. He soon plucked up his old spirits, however, and began to assail Gabriel Harvey, a friend of Spenser and sir Philip Sidney, but an object of constant ridicule by the town wits. Harvey defended himself, but in vain, against the shower of pamphlets which Nash rained upon him. In 1597 Nash produced a satirical play called *The Isle of Dogs*. His satire seems to have been too pungent, for he was arrested and imprisoned in the Fleet. No later work of his is known.

NASH, William, D.D., b. in Stuttgart, Germany, 1807; educated at the university of Tübingen. Removing to the United States, he became a minister of the Methodist Episcopal church at the west, and founded American German Methodism. He published a German commentary on the Bible, and for several years has edited the German publications of the Methodist Episcopal church.

NASHUA, a manufacturing city of New Hampshire, U. S., at the junction of the Merrimack and Nashua rivers. The falls of the latter afford water-power to six large manufacturing companies, which have extensive cotton-mills, machine-shops, etc. It has 10 churches, 3 banks, 2 newspapers. Pop. '70, 10,543.

NASHUA (*ante*), is in Hillsborough co., N. H., 35 m. s. of Concord and 14 m. n.w. of Lowell, on the Boston, Lowell and Nashua and the Concord railroads, and is a terminus of the Nashua and Rochester and the Worcester and Nashua railroads. It was incorporated as a city in 1853, and is now second in the state in manufactures, third in population, and fourth in wealth. Its mills and factories produce annually goods valued between $7,000,000 and $8,000,000. Besides its mills for the manufacture of cotton cloth, the city contains also the Nashua iron works.

NASHVILLE, a city, port of entry, and capital of Tennessee, U. S., on the Cumberland river, 200 m. above the Ohio, and a little n. of the center of the state. The river is navigable by steamboats of 1500 tons 50 m. above Nashville. Five railways connect it with a vast and fertile country. It is a handsome, well-built city, with a state-house, which cost a million of dollars; court-house, 3 universities, hospital, custom-house, theater, penitentiary, free academy, Protestant and Catholic orphan asylums, 34 churches, with numerous daily, weekly, and monthly publications. It has a large commerce, flour, saw, and planing mills, a large cotton factory (with 400 looms and 13,840 spindles in 1875), manufactories of engines and machinery, etc. The value of the wholesale trade in 1873 was $51,261,570. Near the city are the state lunatic asylum, and the "Hermitage," once the residence of president Jackson. Nashville was occupied by the Federal troops in 1862, and here the federal gen. Thomas gained a victory over gen. Hood. Pop. '70, 25,865.

NASHVILLE (*ante*), co. seat of Davidson co., in lat. 36° 10′ n., long. 86° 49′ w., on the Louisville and Nashville, the Nashville and Decatur, the Nashville and Tuscaloosa, the

Nashville, Chattanooga, and St. Louis, the St. Louis and Southeastern, and the Louisville and Great Southern railroads: pop. '80, 43,461. It is built on gradually rising ground, with regular streets, at right angles to each other. The finest public building is the capitol, on an abrupt eminence 175 ft. high; it is 240 by 135 ft., built of limestone and iron, at a cost of nearly $1,500,000. It is three stories high, surmounted by a tower 206 ft. high from the ground. The corner-stone was laid in 1845. Among the other public buildings are the state penitentiary, 310 ft. by 50; the court-house, market-house, county jail, and a lunatic asylum, with accommodations for 400 patients. There are also many handsome private residences. The city is supplied with water from the river by an elaborate system of water-works. A suspension bridge and railroad drawbridge span the river, connecting the city with Edgefield opposite. The educational facilities of Nashville are unsurpassed in the south-western states. Besides its public schools, it contains Nashville university, founded in 1785 under the name of Davidson academy, and which received its present name in 1826; the Fisk university, for the education of colored teachers, founded in 1867, under Congregational control; the Vanderbilt university, founded in 1875, named after the late Cornelius Vanderbilt, of New York, and controlled by the Methodist Episcopal church (south); the central Tennesee college, for colored people, also under Methodist control, founded in 1866; the Nashville medical college, the Tennessee college of pharmacy, St. Cecilia's academy and St. Bernard's academy, Roman Catholic, and others. There is a fine government building, used as a custom-house and post-office. The city has many churches, a state and public library, an opera house, 2 theaters, an elegant masonic temple, national and savings banks, fine hotels, and 22 periodicals, including 2 dailies. The river is navigable during high water from its mouth to Nashville. On account of its situation and ample railroad connections Nashville is the center of a great wholesale trade with the surrounding region. Groceries, cotton, dry goods, liquors, flour and wheat, boots and shoes, are the largest components of this trade. There is a large cotton-factory; and there are saw, flour, and planing mills, iron-foundries, machine-shops, paper-mills, distilleries, tanneries, etc. The city is divided into 10 wards, governed by a mayor, a common council of 20, and a board of aldermen of 10 members. Nashville was settled in 1779, incorporated as a town in 1784, as a city in 1806, and made the state capital in 1843.

NASHVILLE, BATTLE OF. After the battle of Franklin, Nov. 30, 1864, between Hood and Schofield, the latter withdrew to Nashville, which he reached the next day, taking up his position on the heights about the city. Before Hood had established his lines s. of Nashville on the 4th, Thomas had been re-enforced by Morgan's division from Chattanooga, by Steedman's command of 5,000 men, by A. J. Smith's from Missouri, and by additional recruits, so as to be about equal to Hood's except in cavalry. The greater part of the cavalry force of Thomas had gone with Sherman. A storm on the night of Dec. 8, prevented operations for nearly a week. On the night of the 14th a plan of operations was agreed upon and was successfully carried out the next day, in spite of a dense fog in the morning. Hood was driven back of his line of works, to a position at the foot of Harpeth hills. His loss in killed and wounded was heavy; and some 1200 prisoners and 16 pieces of artillery were taken from him. The federal loss was much less. On the morning of the 16th the battle was renewed, and by evening the confederate army was in retreat, having lost in the 2 days' fighting, 4,462 prisoners and 53 pieces of artillery. The federal army followed up the pursuit till the 27th, when the remainder of Hood's army crossed the Tennessee. The main federal army then gave up the pursuit, which was, however, continued by a cavalry force under Palmer, which caught up with the retreating army and destroyed a large amount of property. The loss of Thomas was estimated at about 10,000, during the entire campaign, from Sept. 7, 1864, to Jan. 20, 1865. In the same time 13,189 prisoners and 72 pieces of artillery were captured from the confederates. Hood was relieved from command Jan. 23, 1865.

NA'SMYTH, JAMES; b. Edinburgh 1808; son of Alexander, the landscape painter. By the sale of models of steam engines and other machinery he was able to pay his fees at Edinburgh university, where he studied mathematics, natural philosophy, and chemistry. In 1829 he became assistant to the celebrated London engineer, Henry Maudslay, and in 1834, he began the manufacture of mechanical tools at Manchester, on his own account. The capacity of his Manchester works soon grew too small for the demands of his business, and he built a series of great workshops, called the Bridgewater foundry, near Manchester. Among the mechanical tools which he has invented are the steam-hammer, steam pile-driver, the suction-fan for ventilating mines, the safety foundry ladle, for pouring castings with safety to the workman, a spherical seated safety-valve, and a reversible rolling mill which does away with the necessity of a fly-wheel. He retired from business in 1857, and has since been engaged in researches into the structure of the sun and moon, with telescopes of his own manufacture. He has published *Remarks on Tools and Machinery*, 1858; and in association with James Carpenter, *The Moon Considered as a Planet, a World, and a Satellite.*

NA'SO, a t. in the province of Messina, Sicily, 43 m. w.s.w. from Messina; pop. 2,306. It is a walled t., with a number of fine buildings. There are mineral springs in the vicinity.

NASON, ELIAS; b. Mass. 1811; graduated at Brown university in 1835; devoted himself to music, botany, and the languages; was a teacher and editor in Georgia, and in 1840–49 an instructor in Newburyport, Mass.; has been pastor of Congregational churches in Massachusetts and New Hampshire. He published *Lives* of sir C. H. Frankland, Susanna Rowson, Nathaniel Howe, Charles Sumner, and Henry Wilson; and a *Gazetteer of Massachusetts*.

NASR-ED-DIN, b. Persia, 1831. On the death of his father, Muhammed Mirza, Sept. 10, 1848, he ascended the throne of Persia. His reign has been principally distinguished by his successful contests with the neighboring tribes, his suppression of the sect of the Babis, who revolted and attempted his life in 1852, his defeat in the war with England in 1856–57, the famine which desolated a large part of his country in 1871, and his visit to the principal courts of Europe in 1873, which he described in a curious diary translated into English by J. W. Redhouse. The concessions which he made to baron Reuter for establishing railroads and canals, and working the mines in Persia, ended in no practical results. He has three sons and eight daughters, the heir presumptive is Muzaffer-ed-din, gov. of Agerbaidjan.

NASSAU, an island in the Pacific ocean, lying in lat. 11° 30' s., long. 165° 30' w. It is low and uninhabited, was discovered in 1835 by a captain of an American whaling ship.

NASSAU, formerly a German duchy, now Wiesbaden, a district of the Prussian province of Hesse-Nassau, in 49° 50'—50° 50' n. lat., and 7° 30'—8° 45 e. long., is bounded w and s. by the Main and the Rhine, the Prussian-Rhenish provinces, and the grand-duchy of Hesse; e. by the Hesse and Frankfort territories; and n. by Westphalia. Area, 1802 sq. miles. Pop. '75, 680,215. Wiesbaden possesses very great physical advantages. In its southern districts, nearly the whole of its area is occupied by the Taunus mountains, whose highest point, the great Feldberg, attains an elevation of about 2,750 feet. This range includes within its boundaries the fertile valleys known as the Rheingau. The northern part of the district includes the barren highlands of the Westerwald, whose most considerable peak, the Salzburger Head, is nearly 2,000 ft. high. Besides the Rhine and the Main, which are the boundary-rivers, Wiesbaden is traversed from e. to w. by the Lahn, which becomes navigable at Weilburg, and is augmented by the confluence of numerous other streams, as the Weil, Embs, Aar, Dill, and Elbe. The productiveness of the soil is proved by the excellent quality of the numerous vegetable products, which include corn, hemp, flax, tobacco, vegetables, and fruits, including grapes, which yield some of the most highly esteemed Rhenish wines. The hills are well wooded, and abound with game of various kinds, and the rivers yield an abundance of fish and crustaceans. In the more mountainous districts, iron, lead, copper, and some silver are obtained, together with good building stone, marble, and coal; the chief mineral wealth is, however, derived from the numerous springs, which, directly and indirectly, bring the government a clear annual gain of more than 100,000 gulden. The most noted of these springs, of which there are more than 100, are Wiesbaden, Weilbach, Langen-Schwalbach, Schlangenbad, Ems, Selters, and Geilnau, the majority of which were the property of the duke.

Wiesbaden, which is divided into 12 circles, has few towns of any commercial importance, but it boasts of many fashionable watering-places, which are annually crowded with visitors from every part of the world. Of these, the most considerable are Wiesbaden (q.v.), the capital of the district—pop. '75, 43,674—Schwalbach, Schlangenbad, Fachingen, Selters, and Geilnau. Höchst, an active little place on the Main, is the only manufacturing town of the duchy, but a brisk trade is carried on at many small ports on the Rhine, Main, and Lahn, from whence the mineral waters, wines, and other natural products of the country are exported. The exports are wine—including some of the choicest kinds, as Hochheimer, Johannisberger, Rüdesheimer, Markobrunner, Asmannshäuser—mineral waters, corn, iron, manganese, cattle, etc.; while the imports embrace colonial products, manufactured goods, salt, jewelry, etc.

Nassau had a representative form of government, based on the constitution of 1814; and the duke, who was also a count-palatine of the Rhine, count of Sayn, Königstein, Katzenellenbogen, and Dietz, etc., was assisted in the government by a council of state, presided over by a prime-minister. The legislative assembly consisted of an upper chamber composed of 24 representatives, chosen for six years, and a second chamber, chosen annually. More than one-third of the population belonged to the Catholic church, which was under the ecclesiastical jurisdiction of the bishop of Limburg, who was assisted by a board of commissioners, located at Eltville, on the Rhine; and excepting about 19,000 persons who belonged to the Jewish and other persuasions, the remainder of the people, including the then reigning house, professed the "evangelical" form of German Protestantism, and were comprehended in one episcopal see under the bishop of Wiesbaden. Ample provisions were made in the district for popular education, in furtherance of which there were upwards of 700 elementary schools, with about 1000 teachers, 10 normal schools, a gymnasium, various training, theological, polytechnic, military, and other educational institutions. In accordance with a treaty with Hanover, Göttingen constitutes the university for arts for Wiesbaden, which has also a Roman Catholic theological faculty in conjunction with Hesse-Cassel at the university of Marburg. Wiesbaden, which is the principal seat for all national institutions of literature, science, and benevolence, has a good public library, containing 60,000 volumes, a museum, etc.

Nassau occupied, in conjunction with Brunswick, the thirteenth place in the limited council of the diet, but it had two votes in the *plenum*, or full council. It furnished a contingent of 4,279, with a reserve of 1833 men, to the army of the old confederation.

The receipts, according to the budget of 1866, were 4,461,410 florins derived from the crown domains and indirect taxes, and 317,935 florins from direct taxation, while the expenditure was estimated at 5,804,975 florins. The national debt at the close of 1864 represented a capital of 6,038,300 florins. The duke, who was in possession of very extensive domains, ranked as one of the richest princes of Germany.

In tracing the history of Nassau to its earliest origin, we find that the districts now known by that name were anciently occupied by the Alemanni, and on the subjugation of the latter people by the Franks, became incorporated first with the Frankish, and next with the German empire. Among the various chiefs who raised themselves to independent power in this portion of the Frankish territories, one of the most influential was Otto of Laurenburg, brother of king Conrad I., who became the founder of two distinct lines of princes. The heads of these lines were Walram and Otto, the sons of count Henry I., who, in 1255, divided the land between them. Walram II., the elder, was the progenitor of the house of Laurenburg, which, towards the close of the 12th c., assumed its present name of Nassau from the name of its chief stronghold; while Otto, the younger, by his marriage with the heiress of Gelders, founded the line of Nassau-Gelders, whose last male representative died in 1423, but which still survives through a female branch, in the family now occupying the throne of the Netherlands. This junior branch of the house of Nassau, by inheritance from a collateral representative, acquired possession, in 1544, of the principality of Orange; and since that period the representatives of the Otto line have been known as princes of Orange (q.v.). The Walram line, which in 1292 gave an emperor to Germany, in the person of Adolf of Nassau, was subdivided by the descendants of that prince into several branches, until, by the successive extinction of the other lines, the Nassau-Weilburg family, which at present reigns over the duchy, was left, in 1816, the sole heir and representative of the Walram dynasty in Germany. Nassau had been declared a duchy in 1806, and in 1817 the reigning duke William granted a new constitution; but during the first sittings of the assembly, dissensions arose between the ducal government and the representatives, the former having attempted to establish the proposition that the ducal domains were the unconditional property of the royal house, and that all the expenses of the state would consequently have to be met by taxation.

This proved a fruitful source of dissension between the duke and his people, and the opposition and discontent to which it gave rise were not finally allayed till 1834, when a more liberal ministry under count Walderdorff, succeeded the unpopular cabinet which had hitherto directed public affairs. Concessions were made by the ducal government, which met the requirements of the chambers, and a satisfactory compromise was effected in regard to the crown revenues. In 1836 Nassau joined the German *Zoll-Verein*, and subsequently to that period it has continued to advance in material prosperity. The reigning duke Adolphus William, who succeeded his father, duke William, in 1839, showed the same conservative tendencies as his predecessor. The revolutionary crisis of 1848 found the people, who had been harassed by over-government and by a jealous dread of liberal sentiments, ripe for insurrection. The peasantry rose *en masse* in the rural districts, and revenged themselves for the severity of the game-laws and other obnoxious restrictions by perpetrating the most wanton destruction of game and wood in the forests belonging to the crown and nobility. These disorders were speedily put down by the aid of federal troops, but, notwithstanding the concessions made by the government, the relations between the people and their ruler continued for many years to be unsatisfactory, For the events which led to the incorporation of Nassau with Prussia, see GERMANY.

NASSAU, a co. in n.e. Florida, bounded e. by the Atlantic, n. and n.w. by Georgia, from which it is separated by St. Mary's river; drained also by the Nassau river, its s. boundary; traversed by the Florida railroad; about 600 sq.m.; pop. '80, 6,635—3,560 colored. Amelia island is included in the county. The surface is level, and the soil toward the coast, sandy; rice, sweet potatoes, Indian corn, and molasses are the chief products. Co. seat, Fernandina.

NASSAU, the capital of New Providence, is the center of the trade of the Bahamas (q.v.). It is pleasantly situated on the face of a hill, in lat. 25° 5' n., long. 71° 21' w. Pop. 9,000. The town is well laid out; has several handsome public buildings, and an excellent and well-sheltered harbor. The climate is very salubrious, and Nassau is a great resort of invalids from the north. It has extensive hotel accommodation, a lunatic asylum, and a leper-house, and is defended by two forts. Nassau exports cotton, pimento, and salt. During the civil war in the United States, it became notorious in connection with the blockade-runners.

NASSAU HALL. See NEW JERSEY, COLLEGE OF.

NASSICK', or NASHIK, a t. of British India, in the district of the same name, in the presidency of Bombay, 95 m. n.e. of Bombay, on the river Godavery, not far from its source. It is a town of great sacredness in the estimation of the Hindus—more revered than even Benares—is a great place of pilgrimage, the chief seat of Brahmanism in the Deccan, and the residence of many families of Brahmans, some of them living in great affluence. It contains many temples, which are built along both banks of the Godavery, and on rocks in the river. They are all of black basalt, and dedicated to Siva. Of far greater interest, however, are the Buddhist caves, about 5 m. from the town, which are situated in a conical hill, at a height of about 100 yards from its base. They are rudely executed. The figures which they contain are in a state of good preservation, and the leading figures are those of Buddha; but the whole character of the remains is thought to indicate Buddhism in a state of transition or compromise with Brahmanism. One cave is 45 ft. sq., and its flat roof is wholly unsupported. Notwithstanding the Buddhist origin and character of these caves, the Brahmans of Nassick, for the sake of gain, encourage the popular reverence for them. Nassick contains a resident population of (1872) 22,436.

NAST, Thomas, b. Bavaria, 1840. His parents emigrated to America in 1846, and when only 14 years of age he was employed as a draughtsman on *Frank Leslie's Illustrated Newspaper*. Without having received any regular instruction in drawing, he furnished acceptable sketches for the engravers. He went to England in 1860 to illustrate the Heenan and Sayers prize-fight for the *New York Illustrated News*. He then traveled to Italy to follow Garibaldi, and made sketches of the war which appeared in the *New York Illustrated News*, the *Illustrated London News*, and *Le Monde Illustré*. Returning to America he formed a connection with *Harper's Weekly*, which has continued uninterrupted to the present time. His contributions to that journal are mostly political cartoons, in which he effectively caricatures and satirizes the blunders of public men, and illustrates the leading topics of the day. He appeared as a lecturer in 1873 in many cities of the United States, illustrating his lectures by caricatures drawn on the platform. He started the publication of *Nast's Illustrated Almanac* in 1872, and has illustrated *The Tribute Book*, Nasby's *Swinging 'round the Cerkle*, and other works. He also illustrated the *Pickwick Papers* and *Pictures from Italy* in Harper's household edition of Charles Dickens's works. Although a clever painter in oil and water-colors, he confines himself mainly to drawing upon wood. His quickness of conception and facility of execution are remarkable, and few artists have executed so many pieces in his special sphere.

NASTURTIUM. See Cress and Tropæolum.

NATAL.' The region now forming the colony of Natal derives its name from its being discovered by the Portuguese on Christmas day 1497. It was visited about 1822 by several white traders from the Cape, who found the country in possession of the Zulu chief Chaka, who ruled in a most sanguinary manner over all the tribes from the Umzimculu to the St. Lucia river. He was killed and succeeded by his brother Dingaan in 1838, but the latter having treacherously murdered a party of emigrant Dutch Boers, who had paid him a friendly visit by invitation to buy land, he was attacked and finally destroyed by the Boers, who at that time had emigrated from the Cape Colony in large numbers, and who made his brother Panda paramount chief in his stead, and then settled themselves down in the country as his lords and masters. The British government, however, now interfered, and, after a severe struggle on the part of the Boers, the country was formally proclaimed a British colony on May 12, 1843, since which time it has progressed very satisfactorily. In 1856 it was erected into a distinct and seperate colony, free from the control of the governor of the Cape. In 1873 Langalibalele, a chieftain of Zulus within the n. frontier, was on suspicion treated very summarily by the colonial government, and banished. The English government decided that the proceedings were illegal, and sir Garnet Wolseley was sent as temporary governor. It was mainly because the security of Natal was menaced by the warlike forces and equipments of Cetewayo, nephew of Dingaan, king of the free Zulus, that the Zulu war of 1879 broke out. Zululand was invaded by the British, and after a fierce defense was finally parceled out amongst various chieftains, nominally independent, but under the supervision of British residents.

The colony of Natal is on the s.e. coast of Africa, about 800 m. e.n.e. of the cape of Good Hope, between the 29th and 31st parallels of south latitude. Its n.e. boundary is the Tugela or Buffalo river, which divides it from Zululand, and its s.w. boundary is the Umzimculu and Umtamouna rivers, separating it from Kaffraria proper. A lofty and rugged range of mountains called the Quathlamba, or Drachenberg, divides it from the Free State and Basutuland, and it contains a well-defined area of 20,212 square miles.

These mountains are composed of a confused mass of granite, gneiss, sandstone, basaltic veins, and shale, and present both the flat top and serrated summits of the chain, of which they are a continuation, so well known in the Cape Colony as the Sneeuwberg and Stormbergen. About lat. 28° 30′ these mountains seem to reach their culminating point, and probably attain a height of 10,000 ft., forming a summit line of watershed, from which flow to all points of the compass the waters of the Orange, Umzimvoobo, Vaal, Tugela, and other large South African streams. Towards the coast these mountains present a scarped and almost inaccessible face; towards the interior, however, they gradually die away into the immense rolling plains of the Free State. Many offshoots from these mountains traverse the colony, dividing it into a series of steps or plateaux, gradually rising from the coast region to the foot of the mountains, and forming so many zones of natural productions.

The coast region, extending about 25 m. inland, is highly fertile, and has a climate almost tropical, though perfectly healthy. Sugar, coffee, indigo, arrowroot, ginger, tobacco, and cotton thrive amazingly, and the pine-apple ripens in the open air with very little cultivation. The midland terrace is more fit for the cereals and usual European crops; while on the higher plateau, along the foot of the mountains, are immense tracts of the finest pasturage for cattle and sheep.

The climate is very salubrious; the thermometer ranges between 90° and 38°, but the heat, even in summer, is seldom oppressive. The mean annual temperature at Pietermaritzburg, the capital, is 64° 71′. The winter begins in April and ends in September; the average number of rainy days being 13. In the summer season the thunder-storms are very frequent and severe. The annual rainfall on the coast is about 35 inches. Inland it varies a good deal in different districts, and is greatest in summer. The south-east is the prevailing wind here in the summer months, as in the Cape Colony. Occasionally the sirocco or hot wind from the north-west is felt, which generally terminates in a thunder-storm.

Natal has but one harbor on its coast, and that is D'Urban, or Port Natal, in lat 29° 53′. It is completely landlocked, but a bar prevents vessels above a certain tonnage from entering. There is, however, generally a depth of water on it varying from 9 to 18 feet. There is secure holding-ground in the outer anchorage, The harbor of D'Urban is of great importance to Natal, as it is the only one worthy of the name on the south-east coast. Many extensive engineering operations have been carried on with the purpose of improving the harbor and increasing the depth of water at the entrance. The principal rivers are the Tugela or Buffalo, the Umcomanzi, Umgani, and Umzimculu; like the majority of South African rivers, they are of no use for purposes of inland navigation; but their streams are permanent, and often available for irrigating purposes, thus giving Natal in one very essential point a decided superiority over the Cape Colony.

Coal, copper-ore, iron, and other minerals are found in several places, and there is no doubt that when the great mountain-range is properly explored it will be found very rich in mineral wealth. Large forests of valuable timber abound in the kloofs of all the mountain-ranges, and many tracts along the coast are also well wooded. Natal is divided into the following counties: D'Urban, Victoria, Alexandra, and Alfred on the coast region; Pietermaritzburg, Umcomanzi, and Umroti, central; and Klip River and Weenen at foot of the mountains. The capital is Pietermaritzburg, with about 6,800 inhabitants, on a tributary of the Umgani river, about 50 miles inland. It possesses a large military establishment, and many substantial public buildings. Its name is a compound of the Christian name of Pieter Rietief, and the surname of Gert Maritz, two celebrated leaders of the emigrant Boers who were murdered by Dingaan. D'Urban, or Port Natal, is also a very flourishing town, having a railway connecting the landing-place at Point Natal with the town, and a population of (1872) 6,276. It has two newspapers, and several banks and other public institutions. Verulam, Weenen, Richmond, Newcastle, and Ladysmith are also flourishing towns, and several other new villages have been recently formed.

Natal is governed by a lieut.-gov., aided by a legislative council, consisting of thirteen members appointed by the colonial office, and fifteen elected by the constituencies into which the colony is divided. Municipal institutions have been granted to the principal towns. It forms the diocese of a colonial bishop, and many stations of the Wesleyan, American, Norwegian, and Berlin missions exist. Education is receiving much attention, and schools are multiplying.

The De Beer and Bezuidenhout passes are the only practicable roads across the mountains, and lead by very circuitous routes across the Free State into Cape Colony; and the numerous mountain streams wanting bridges render internal communication very difficult. Three lines of railway, of a total length of 104 miles, are in course of construction; the chief to connect D'Urban with the capital.

The principal articles of export from Natal are wool, sugar, ivory, and hides. The wool exported to Great Britain in 1875 was valued at £514,310, and weighed 8,328,524 lbs. The total value of exports for the same year was £985,695. The exports comprise cotton, ivory, sugar, coffee, arrowroot, wool, hides, feathers, molasses, and rhinoceros horns. The value of imports in 1875 was £1,268,838. The revenue of the colony in 1875 was £260,271, principally raised from custom duties, transfer dues, and taxes on native huts, etc. In 1843 the value of imports was £11,712, that of exports £1261, while the revenue was only £12.000. Natal's productions were very respectably represented in the great exhibition of 1862, and formed one of the most interesting of British colonial compartments. The population consists of Dutch Boers, who remained in the country after it became a British colony; of English and German settlers; and the remains of the Zulu tribes, who originally possessed the country. It numbered, in 1877, 325,512, of whom 22,654 were whites. The natives, the most industrious of the Kaffir races, possess horses, cattle, sheep, etc., valued at £1,500,000, and, properly managed, make excellent servants.

The total tonnage of the vessels that entered and cleared the port of Natal in 1875 was

137,227 tons, of which 121,322 were British. The discovery of diamond-fields on the Vaal river is an event in which the colony is deeply concerned.

The large animals are gradually disappearing, although elephants are still occasionally met with in the dense bush of the coast region. Lions, leopards, wolves, and hyenas still hang on the outskirts of civilization. The smaller antelopes are plentiful, and alligators are met with in nearly all the rivers north-east of the Umzimculu. Natal, besides several poisonous snakes, produces a small species of boa, which sometimes attains a length of 16 feet. The hippopotamus is still found near the mouths of the rivers on the eastern frontier.

The botany of this region resembles that of Kaffraria proper, although generally of a more tropical character. All the timber-trees of the Cape Colony are found here, besides many new ones. The climate of the coast region, however, is too warm for the grape, at least for the purpose of wine-making.

Brook's *Natal*, by Mann (1869); Hall's *South African Geography; Natal Almanac* (1875); *The Cape and South Africa*, by John Noble (1878).

NATAL, or RIO GRANDE DO NORTH, a fortified sea-port of Brazil, capital of the province of Rio Grande do Norte, and built on low lands about three miles from the mouth of the river of that name, 100 m. n. of Parahiba. Pop. 10,000.

NATAL, JOHN WILLIAM COLENSO, D.D., Bishop of, a divine of the church of England; was b. in 1814, and educated at St. John's college, Cambridge, where he graduated as second wrangler and Smith's prizeman in 1836. From 1838 to 1842 he was one of the masters of Harrow school, and for the next four years tutor of St. John's college. In 1846 he was appointed rector of Forncett St. Mary, in the co. of Norfolk, and in 1854 first bishop of Natal, South Africa. The works by which he was, until recently, most widely known were his two treatises on algebra and arithmetic. The treatise on algebra was first published in 1849, and that on arithmetic in 1853. They soon acquired great popularity, and have been adopted as text-books in many of the principal schools and colleges in Great Britain. He has also published other educational works. He first attracted public notice, however, by the dedication of a volume of sermons to the rev. Mr. Maurice (q.v.), at the moment when that gentleman was in disgrace with the "orthodox" section of the religious world. His affection and respect for Mr. Maurice were further shown by his edition of the *Communion Service, with Selections from Writings of the Rev. F. D. Maurice* (1855). In the same year appeared his *Ten Weeks in Natal;* in 1861 his *Translation of the Epistle to the Romans, commented on from a Missionary Point of View;* and *A Letter to his Grace the Archbishop of Canterbury, upon the Question of the Proper Treatment of Cases of Polygamy, as found already existing in Converts from Heathenism*, in which he recommends, on grounds both of reason and Scripture, that converts to Christianity, already possessing several wives, should *not* be forced to put them all away, except one. He admits that monogamy is most in harmony with the genius of Christianity, but would enforce it only in the case of those who married *after* their conversion. The outcry raised by his professional brethren against the *Letter* was sufficiently loud, but it was nothing to the tempest of disapprobation that burst forth in the following year (1862), when he published *The Pentateuch and Book of Joshua Critically Examined*, in which he endeavored to prove that, as they stand, these books are not the products either of the age to which they are usually assigned, or of the authors whose names they bear; and that they are not entirely historical, but in many most important passages are overlaid with legendary, mythical, and symbolical incidents. Part VII. of this work was published in 1879. The bishop of Cape Town, the metropolitan bishop, declared Colenso deposed from his see; but on an appeal to the privy council in 1865, the deposition was pronounced null and void. In 1874 Colenso visited England to plead the cause of Langalibalele (see NATAL). Other works by the bishop are *Natal Sermons* (1866) and *Lectures on the Pentateuch and the Moabite Stone* (2d ed., 1873).

NA'TANT. See NAIANT.

NATATO'RES (Lat. swimmers), the name given by Illiger and many other ornithologists to the order of birds called *palmipedes* (q.v.) by Cuvier.

NATCHEZ, a tribe of Indians who formerly occupied the country including the site of the present city of Natchez, and who, when discovered by the Spaniards in the latter part of the 16th c., possessed a civilization far in advance of other tribes in their neighborhood, and in some particulars exhibiting the characteristics of the Aztecs. They were sun-worshipers, and preserved the custom of maintaining a sacred fire in their temples perpetually burning. Their ancestry was mythical, but they were ascribed to the Huaxteco-Maya family. They were brave, but possessed many vices; and although they established and sustained friendly relations with the French, which were seldom interrupted, they were in 1729 guilty of an act of treachery towards the latter, in organizing their wholesale massacre on account of some fancied harshness of treatment at the hands of the French commander, which brought about a general war. The French, with the assistance of the Choctaws, attacked and destroyed a large portion of the tribe, and sold as many as 400 into slavery, driving the remainder over the Texas border. The remnant of the Natchez, about 300 in number, at present live in company with the

Chickasaws and Muskogees, and continue to retain their ancient form of organization and certain of their customs and rites.

NATCHEZ, a city and port of entry in Mississippi, on the e. bank of the Mississippi river, 280 m. n. of New Orleans. It is finely situated on the bluff, 150 ft. high, which here forms the bank of the river. A portion of the town at the bottom of the bluff is called Natchez-under-the-Hill, and was formerly the resort of the river gamblers, pirates, and other desperate characters. The city has eight churches, a court-house, jail, U. S. marine hospital, a daily and two weekly papers. It is the shipping port of a large and fertile cotton district, and has steamboat connections with the whole Mississippi valley. Natchez, which derives its name from a noted tribe of Indians, was settled by the French in 1716 and destroyed by the Indians in 1729, who were subsequently defeated and banished to the West Indies. Pop. '70, 9,057.

NATCHEZ (*ante*) is in Adams co., and in population is the second city in Mississippi. It has a historical record full of vicissitudes. Its site was chosen by the French in 1700 as the chief place of a number of proposed settlements in the lower Mississippi territory; and it was a French military and trading post 63 years, when it passed into the hands of the British. Next, it was occupied by the Spaniards; then by treaty in 1798 it came into the possession of the United States, and became the capital of the state. Seventeen years later, however, the seat of government was removed to Jackson. It has been laid in ruin once by a tornado, and was captured during the civil war by Farragut. It was formerly the residence of many wealthy planters, and is still a typical southern city, with broad, handsomely laid-out streets, and residences adorned with large gardens. The annual shipment of cotton is usually from 18,000 to 20,000 bales.

NATCHITO'CHES, a tribe of Indians of the Huaxteco-Maya family, presenting the same characteristics as the Natchez, and who formerly inhabited lands along the Red river in Louisiana. Here, on an island, they possessed a fortified town, which they were forced by the Natchez to evacuate, when the latter were expelled by the French from their own territory in 1731 and forced to flee into Texas. The Natchitoches united with the Caddoes, with whom the few of them who still exist continue to live.

NATCHITO'CHES, a parish in n.w. Louisiana, bounded on the e. by Saline bayou, and drained by Red river; 1200 sq.m.; pop. '80, 19,723—19,473 of American birth, 12,080 colored. The surface is mostly level and heavily wooded, and there are several lakes. The soil, especially in the river bottoms, is fertile. The principal productions are Indian corn, cotton, and sweet potatoes. Other staples are cattle and wool. Co. seat, Natchitoches.

NATIC'IDÆ, a family of gasteropod mollusks, of the section *branchifera*, order *prosobranchiata*, sub-section *holostomata*. See INVERTEBRATE ANIMALS. This sub-section also includes the periwinkles, river-snails, top-shells, ear-shells, tooth-shells, and limpets. In *naticidæ* the shell is globular, of few whorls, small spire, outer lip acute; foot very large; mantle lobes hiding more or less of the shell. The most important fossil genus is *natica*, in which the shell is thick, smooth, and polished, often with colored markings. Fossil naticæ have been found in upper Silurian, Devonian, carboniferous, and Permian formations, and they are abundant in the triassic, Jurassic, cretaceous, and tertiary. The family is extensive, and is distributed throughout all seas. The following genera are now recognized: *natica, surinatia, neverita, polinices, mammilla, cernina, amaura, amauropsis, naticina*, and *sigaretus*, most of the species belonging to these genera being found on the American coasts. They are carnivorous, feeding upon other mollusks, and also upon dead fish. The teeth, situated upon the lingual ribbon, enables them to perforate shells. Some of them make a peculiar nest in the sand, in the shape of a bowl, in which the eggs with their embryo shells are contained, each in a small cell; and they were formerly mistaken for corals.

NATICK, a t. in Middlesex co., e. Mass., 17 m. from Boston and 4 m. from Framingham; incorporated 1781; on the Boston and Albany railroad, the terminus of a branch road to Saxonville; pop. '80, 8,480. Lake Cochituate lies directly n., between this town and Wayland. The Charles river waters its s. portion. It was for several years the residence of Henry Wilson; has a public library of 10,000 vols. in an elegant building, excellent schools, a weekly newspaper, a national bank, a savings bank, water-works, and gas-works. Its leading industries are the manufacture of hats, base-balls, and shoes, and it is celebrated for its extensive boot and shoe manufactories. Farming and market gardening are carried on to some extent. In the cemetery is a monument to John Eliot, who brought the settlement of "praying Indians" from Nonantum to Natick in 1651, and established a church there in 1660, which flourished for many years, on the site of which the Unitarian church now stands. The town includes Felchville and South Natick, each having churches and schools, the latter a museum of natural history and a shoe factory.

NATION (Lat. *natio*, from *natus*, born), a word used in two distinct senses. 1. A state or independent society united by common political institutions; 2. An aggregate mass of persons connected by ties of blood and lineage, and sometimes of language.

The modern dogma of nationalism, as maintained by a class of continental politicians, starts from an assumption that a nation in the latter sense ought necessarily to be also a nation in the former, and endeavors to assign limits to the several races of Europe, with the view of erecting each into a distinct state, separated from other states or nationalities. The extreme politicions of the national school seem to consider the supposed rights of nationalities as paramount even to the obligations of treaties, and the political conjunction of one nationality with another is looked on by them as an adequate ground for a revolt or separation, apart altogether from the question whether the nationality is well or ill governed. In point of fact, the different races in Europe are so commingled, that any reconstruction of the political map of Europe, on ethnological principles, would be impossible, even if desirable. The blood of nine-tenths of Europe has been mixed within the historical period. The test of language, on which nationality has sometimes been based, is a deceptive one, in so far as it is indefinite and perpetually fluctuating. The people on the frontier between two races, as in the south Tyrol, generally speak two languages. Then we have dialects, like the Walloon, the Grödnerisch of the Tyrol, and the Romansch of the Grisons—as also the Breton, Welsh, Gaelic and Irish languages, which could hardly be made the basis of independent communities. The well-being of the people governed is properly the end of all government, and it has practically not been always found that a state is better governed when it consists of one race only, than when it includes an aggregate of races. Highly diversified nationalities may be united in one political system, provided only that the government respects and consults the peculiarities of the several races and does not attempt to force the usages, habits, or language of one on the rest. See Ethnology.

NATIONAL CONVENTION, an assembly of deputies of the people, which assumed the whole government of France on the overthrow of the throne in 1792. When the national assembly (see Assembly, National) had decreed the suspension of the king, Aug. 10th, 1792, it appointed the election of the national convention, which commenced its sittings Sept. 31st. Its first act was to declare France a republic, Sept. 25th. Upon this followed the trial and condemnation of the king. Through the support of excited mobs, the extreme Jacobin party became predominant in the convention; where, from the elevated seats on which its members sat, it received the name of the *mountain* party. The *revolutionary tribunal* was established; the chief administration of affairs was intrusted to the *committee of public safety*, which exercised the most despotic powers. The Girondists (q.v.), at first a powerful party in the convention, were destroyed, many of them perishing by the guillotine; and a new constitution, thoroughly democratic, was adopted Aug. 10th, 1793; but its operation was suspended until peace should be restored. Meanwhile, the actual rulers of the country displayed marvelous energy; almost a million of citizens being placed under arms, and immense provision of all warlike stores made by means of requisitions. They also proceeded with merciless severity against their political opponents, dealing with them as traitors; hundreds of thousands were thrown into prison; and the number who died by the guillotine increased daily both in Paris and throughout France. The national convention itself latterly became subject to the dictatorial power of Robespierre; many of its members were guillotined within a few weeks; and independent opinion was no longer expressed. The overthrow of Robespierre was followed by a great reaction; the Jacobins were suppressed; and finally, the national convention, after concluding peace with Prussia and Spain, dissolved itself Oct. 26th, 1795 (4th Brumaire of the year IV.), leaving to the nation a new constitution which placed the government in the hands of a directory (q.v.).

NATIONAL COVENANT. See Covenant.

NATIONAL DEBT. See Debt, National.

NATIONAL EDUCATION. The general subject of education has been already treated under that head. By the term "national education" is understood (1) the means taken by the body of any nation, either through the state or other organizations, for educating the people; (2) the objects which the nation ought to place before itself in its educational measures. These questions involve the whole inner and outer history of education, and are far too large and important to be capable of such treatment here as would convey accurate notions to the reader. All we can do is to glance slightly at the history of the two branches into which the subject divides itself. Among ancient nations, and among not a few nations now existing, education in any definite sense did not, and does not, exist for the masses of the people. The children grow up in reflective or unreflective imitation of their fathers. But at all times, nations which have quite emerged from the savage state, have had some more or less organized scheme of education for the leisured and governing classes. The purpose kept in view in such education has been to fit the pupils to discharge certain duties of war or government. In addition to this, the priesthood had the education which their traditionary hymns, laws, and customs afforded. That man as such, apart from any special practical ends, should be educated, was an idea late of being recognized, and occurred first to the Greeks, to whom the world owes so much. But neither among them nor their imitators, the Romans, was the education of *the masses of the people* ever contemplated. Education, properly so called, was confined to a few. In the centuries which succeeded the introduction of Christianity, the church was the great educating body—training those intended for the service of the altar, not only in Christian doctrine, but in all the learning of the past. This, at least, was the general tendency of education in the church. But it was not till the reformation in the 16th c. that learning, even to the limited extent of reading and writing, was considered a worthy object of pursuit by any save those who, in some form or other, were destined to be drawn within the clerical ranks. The reformation introduced the idea of educating the masses of the people—the leaders of this movement being, no doubt, forced to this conclusion by the necessity which their view of man's personal religious obligations imposed on them. It was manifestly a corollary from the position they took up that *every man's* intellect should be so trained as to be able to read, and inquire, and think for itself. It was only very slowly that so large a conception of the sphere of education could be given effect to. Gradually, however, popular schools arose in many parts of the continent of Europe, especially in Germany, and the number of gymnasia or grammar-schools was, during the same period, increased. In Scotland, so early as 1696, the government took up the matter, and ordained that there should be a school as well as a church in every parish, at the same time providing for their maintenance by a tax on land, and for their management by putting them under a certain number of those who paid the tax conjoined with the minister of the parish—all being subject to the presbyteries within whose bounds they were situated. The example of Scotland cannot be said to have been followed on anything like a national scale by any country till after the French revolution had exhausted itself. Since 1815, the distinguishing idea of government administration may be said to be the necessity of educating *the people, and all the people*—even the outcast and the criminal. During the last fifty years, all the German states, and more especially Prussia and Saxony, have developed excellent national systems of education, and France has followed their example. Russia and the new kingdom of Italy are also now organizing primary instruction; and at the same time, as in all European countries, they are making provision for the instruction and professional training of the teachers in normal schools (q.v.) The schools for instructing the middle classes, and grammar schools (French, *lycées;* German, *gymnasiums*), whose object is to prepare pupils for the universities, have received increased attention. Universities themselves, too, have been further developed, their curriculums extended in range, their objects elevated, and their number increased.

To return to primary instruction. In England there was no national system, properly so called before 1870, but voluntary efforts were largely aided by the state in the form of privy council grants. These grants were also extended to Scotland, as it became necessary to supplement the parochial schools there, owing to the increase of population. The principal conditions on which these grants were made were that they were only to *supplement* local efforts, that the schools should pass a satisfactory examination before a government inspector, and that the Bible should be read in them. As much additional religious instruction might be given as the school managers pleased, but no schools were admitted to privy council aid from which the Bible was excluded. Under the stimulus afforded by these grants, the educational wants of England were, after 1839, to a great extent supplied; but many districts were left unprovided with schools, and many more very badly supplied. In 1870 an important measure, entitled "An act to provide for public elementary education in England and Wales," was passed by parliament, according to which it is enacted that "there shall be provided for every school district a sufficient amount of accommodation in public elementary schools available for all the children resident in such district, for whose elementary education efficient and suitable provision is not otherwise made." It is enacted further, that all children attending these schools whose parents are unable, from poverty, to pay anything towards their education, shall be admitted free, and the expenses so incurred be discharged from local rates. The new schools are placed in each district under "school-boards" invested with great powers—among others, that of compelling parents to send their children to school. An act in most respects similar to the above was passed in 1872 for Scotland, whose educational wants had previously been well supplied.

In Ireland, a national system, instituted and maintained by the state, exists, and one of its main features is the separation of the religious from the secular teaching—at least in theory. The extent to which this principle has been encroached upon in the course of working out the scheme, is not accurately known, but is worthy of special inquiry.

In the British colonies, as in the U. S. of America, adequate state systems of education have been provided on the basis of the secular principle. See the articles NATIONAL EDUCATION, and PRIVY COUNCIL, COMMITTEE OF, ON EDUCATION.

NATIONAL EDUCATION, SYSTEMS OF, the provision made by various states for the education of their citizens. In England the term national education is commonly used as implying only a provision made for the instruction of children of the poorer classes. But it is capable of a much more extensive application, and in most of the countries in which the state provides for the education of the people, the state regulates, more or less, all instruction, from that of the primary school to that of the university. In England, national education in this sense has no existence. The parish schools (q.v.) of Scotland at one time were all but national, but the altered circumstances of the country gradually deprived them of that character. The imperfect means adopted to supply the deficiency in both parts of the kingdom are described under the head of Privy Council, Committee of, on Education. See also Schools, Public and Grammar; Industrial Schools; Reformatory Schools, etc. In Ireland the foundation of a really national system was laid in 1833 in the "national schools" (supplemented since by the queen's colleges and university), the principle of which is briefly stated under Ireland. These schools have exhibited a steady and even surprising progress, when we consider the determined opposition they have met with from powerful ecclesiastical parties, both Catholic and Protestant. In several of the British colonies the local legislatures have boldly dealt with the question on the national principle, in opposition to the denominational. . See Victoria.

In this article we propose to give some account of the national system in various countries, and to indicate some of the matters as to which we have to look for instruction to foreign experience. Before doing so, it may be well to notice the obstacles in the way of the establishment of national education among ourselves. And first, in Great Britain the establishment of a national system of education, and of all interference with education on the part of the state, has until lately been opposed upon principle by a numerous and respectable body of politicians. They, for the most part, consisted of dissenters, who, beginning with voluntaryism in ecclesiastical matters, had passed on to the doctrine of *laissez faire* in politics. The others were chiefly speculative persons, deeply imbued with the same doctrine, who, profoundly disbelieving in the wisdom of statesmen and the capacity of officials, and apparently in the possibility of foresight in large affairs, held that the state should undertake as little as possible, and leave things to what they called their natural course. The arguments used by these two classes were not always alike. Individuals of the former class were apt to go back to the religious ground from which they started, maintaining that education ought to be religious, that the state ought not to teach religion, that therefore education was out of the province of the state. But what the spokesmen of both classes most insisted on was this: that education should be left to the law of supply and demand, or rather, to the voluntary action of individuals, single or combined. It was in that way, they declared, that the education of the people could be most beneficially carried on; for so carried on, it would always be, both in kind and in extent, what, on the whole, the circumstances of the people required. In the hands of government, they said, an educational system must be, more or less, an instrument of state. And, at the best, the extent and the quality of the instruction provided must depend upon the will of persons who might be very ignorant of the wants of the people. They used declamation about the bad way in which governments did everything they attempted; about the danger of creating a host of new officials; and about the impropriety of interfering with natural laws, and of discouraging voluntary agency. Then they enlarged upon the great progress which education had made in England since the beginning of this century, independently, as they said, of the state—maintaining not only that it had been as great as the circumstances of the country permitted, but that it was almost as much as the state had accomplished in any country; and that it proved that in England, supply and demand, or the voluntary principle, would soon provide for the education of the whole people. The greater part of the increase in the supply of education, so far as it was not due to the action of the state, had come from the benevolent exertions of individuals. But their chief reliance was upon the agency of individuals or societies inspired by benevolence or religious zeal. They held that the same objections did not apply to voluntary organizations which lay against the state: they declared that it was the great glory of England to accomplish, by such means, things which elsewhere were attempted only by the state. Combined voluntary action, they said, was consonant with the national habits and institutions; it was a part of the system which had made the English a free, self-reliant, and enterprising race; it should be fostered, not discouraged; and it was worth our while to pay a price, if necessary, rather than let it be superseded by the action of the state.

It was answered, first, that the commercial principle of supply and demand, unless supplemented by the benevolence of individuals, could not be expected to educate the people except by very slow degrees; that education must create the demand for education; that children of the lower classes in large towns, unless assistance or stimulation came to them from without, had at present no more chance of receiving instruction than if they were living in Africa. And the nation would lose incalculably by delay in educating the masses; for nothing would so greatly increase its power and prosperity, so materially improve the condition of the humbler classes, as the education of the whole people. The importance of voluntary agencies was admitted; but why was the state to be precluded from at least co-operating with them? The state, it was said, had a greater interest in educating the people than any of her citizens could have; and, moreover—this was the real question—could undertake it more successfully. Voluntary agency, it was maintained, was too slow, too uncertain, too spasmodic in operation, to be permanently and solely relied upon in a matter of such great national concern. The friends of state action confidently appealed to the experience of foreign countries as showing the superior efficiency of state education, and pointed to the effects which government stimulation, on a limited scale, had had at home. It is now several years since this controversy was at its height. The voluntaries have since that been acquiescing in the interference of the state with education; and recently, several of their foremost men have frankly admitted that they had been mistaken, and that the state, by what it has done for education, has made good its claim to the regulation of it. The course of political events has recently added greatly to the importance of popular education; and at present it may be said that there is practically no opposition upon principle to the control of education by the state.

There have always, however, been obstacles to the establishment of a national system more formidable than the opposition of private bodies, and these are well-nigh inevitable.

The most important of them are those which are concerned with the place, if any, to be assigned to religion in the school instruction. Upon this matter there is a conflict of opinions which seems almost irreconcilable. A party, which is growing in numbers, and which is respectable from its activity and intelligence, holds that the state should give nothing but secular instruction; that religion is beyond its province, and should not be taught within its schools; that, indeed, with a population divided into numerous sects, a practicable scheme of state education embracing religion cannot be devised. To this party a portion of the English voluntaries now seems disposed to ally itself. There are others who believe it possible to teach an undenominational Christianity in schools; who desire that the state schoolmaster should confine himself to this; and that dogmatic teaching should be left to the religious bodies. A third party hold that dogmatic teaching should be given in state schools; that religious teaching, to have any value, must be dogmatic; but that arrangements might be made for the religious instruction of children by persons of their own persuasions; and, at any rate, that children should be exempted from the religious instruction given in a school if their parents should so desire. The most numerous body of all are satisfied with the system of aiding denominational schools which now exists; because they approve of schools being, as for the most part they now are, under clerical supervision, and fear that by any change the influence of the clergy upon education would be weakened. Among the managers of church of England schools fault is scarcely found with more than one point in the old substitute for a system; there was an incessant agitation against the "conscience clause," which the state has placed among the conditions of its aid, stipulating that religious instruction should not be given contrary to the wish of the parent. Between the denominationalist and the secularist there is a difference which scarcely admits of compromise, and is a serious hindrance in the way of any national system. The former is naturally opposed to any scheme for supplementing the denominational system—for the purpose of educating the classes which this system does not educate—unless it include religious teaching.

The question of religious instruction has been found a troublesome one in nearly every country where the state regulates education, and there is nothing more instructive, in foreign experience, than the ways in which, in different systems, this difficulty has been disposed of. Next to this, the most important thing to be observed is the parts which, in different systems, are assigned to the state and to the locality respectively; for it is unquestionable that there are some dangers attaching to state education, when the influence of the state is predominant, and that the function of the state in education must be carefully defined. By the mere selection of school-books, the state could powerfully influence the rising generation; and in Austria, and, it is said, in France also, the school has been made use of as an instrument of state policy. With a popular government, however, there is not much risk of it being used for sinister purposes; and in this country we are in more danger of having recourse too little to the powers of the state than of trusting it too much. The possibility of making education compulsory is another matter upon which foreign systems of education throw much light: we are perhaps more interested in noting how far indirect methods can be resorted to for compelling attendance at the schools. Upon the limits of the instruction which should be attempted in schools for the poorer classes—a subject which has been much discussed in connection with the Revised Code of 1861—and upon the results of government regulation of the middle and upper schools also, there is much to be learned from the foreign educational systems. We begin with

State Education in Holland.

There are several countries in which—if school statistics could be taken as a test—popular instruction is more widely diffused than it is in Holland; but in no European country is it so uncommon to meet a man who cannot easily read and write. The primary schools of Holland have a high reputation for the solidity of the instruction they impart, and have, by competent observers, been declared to be the best in Europe. A small and wealthy state—rich, too, in the public spirit of its citizens—with a population singularly docile and orderly, the task of educating the people has been for Holland exceptionally free from difficulty. It had the start of most other European nations in the work of popular education. So far back as 1811 its primary schools had been celebrated in a report by the famous Cuvier. It has had an education law since 1806; and of this law, though it underwent modification in 1857, it is necessary to give some account. Secondary education in Holland was officially instituted and organized for the first time by the law of May, 1863.

On the face of it, the law of 1806 seemed far from making a complete provision for the education of the people; it left much—in any other country, it would have been a great deal too much—to the public spirit of local authorities. It did not make education compulsory; it did not even enforce the establishment of public schools; but it provided for two things being done thoroughly—the inspection of the schools and the examination of the teachers—and to this seems to have been chiefly due its eminent success. Each province of Holland was formed into a certain number of school-districts, and over each school-district was placed an inspector. The inspector was made supreme over primary instruction in his district. He was a member of every school-committee, and school-committees could be named only with his concurrence; no teacher, public or private, could exercise his calling without his permission; and he inspected every school in his district twice a year. The united inspectors of the province formed the provincial commission for primary education. This commission met three times a year, and received from each of its members a report upon his district; once a year, it sent a deputy to the Hague, to form with the deputies from other provinces, a commission to discuss and regulate school-matters, under the direction of the minister for the home department and his inspector general. The inspectors in the various provinces were appointed by the home office, on the presentation of the provincial commission. It has been said that in Holland public spirit is very strong. State employments are thus deemed very honorable; and the inspectors gave their services gratuitously—receiving only an allowance for expenses. It was one of the duties of the provincial commission to examine teachers for certificates. First, the teacher had to get a *general admission*—a certificate of competency, admitting him into the teaching profession; he had to get a *special admission* also, before he could exercise his profession. There were four grades of certificates—the first or second grade had to be obtained by a school-master, public or private, in the towns; the third grade qualified for a village school; the fourth grade was for under-masters and assistants. To the highest grades were admitted those candidates only who gave signs of a *distinguished culture*. For public masterships, when they fell vacant, a competitive examination was held; the successful candidate received his *special admission*—his appointment to exercise his profession in the school. For special admission as a private teacher, there was no second examination; it was in the power of the municipality, with the concurrence of the inspector, to grant it upon application. Although there were no obligatory provisions in the law, the provincial and communal administrations were charged by the government to provide the means of instruction in their localities, to insure a comfortable subsistence for teachers, and to obtain a regular attendance of the children in the schools; and they did all this to the best of their ability. Free schools for the poor were provided in the towns; in the villages, schools to which the poor were admitted gratuitously. Every effort was used, both by the lay authorities and the clergy, to draw poor children into the schools; and the school-masters were provided with incomes much superior to what is usually paid to school-masters in any other European country. To this M. Cuvier attributed much of the success of the Dutch schools. Some of the best scholars were kept in the school to assist in the teaching; they became under-masters, and eventually masters; and thus, even before the institution of normal schools, an efficient body of teachers was provided. In the normal schools which were afterwards established, school-methods and the practice of teaching formed a more prominent part of the instruction than in those of other countries. It soon appeared that the free schools for the poor in towns were giving better instruction than could be obtained by the lower middling classes; and intermediate schools had to be established in the towns (*tusschen-schoolen*), in which, for a small fee, an excellent education was provided. Above the intermediate school was the French school, in which, besides a sound commercial education, modern languages were taught; above that was the Latin school, giving a classical education, and preparing for the universities. The classical schools and the universities of Holland do not receive from foreign observers the commendation so freely bestowed upon the other parts of the educational system of the country.

Under this law, the public schools were non-denominational; no dogmatic instruction was to be given by the teacher or in the school; but the instruction was to be such as to "train its recipients for the exercise of all social and Christian virtues." The religious education of the children, however, was not overlooked. The government exhorted the clergy of the different communions to take upon them the religious instruction of children of their own persuasions; and this the clergy willingly did—giving up a portion of every Sunday to this duty. The school-master instructed the children in the truths common to all religions, and on Saturdays, when the Jews were absent, in the New Testament and the life of Christ. M. Cuvier, in 1811, stated that he found the education religious, though not dogmatic; and in 1836, high satisfaction with it was expressed by M. Cousin, an earnest advocate of religious education. It was thought that the Dutch schools had proved the possibility of teaching in schools an unsectarian Christianity. But it was chiefly upon this point that the controversy arose which led to the enactment of 1857; and as regards it, it cannot be said that the controversy is yet ended.

There were other matters which excited a demand for the alterations then made in the law. The constitution of 1848 had granted the liberty of instruction, and was therefore in conflict with the law of 1806. The school-attendance had been falling off. Some of the municipalities had been evading their duty to the school-masters and the schools.

It was thought desirable that the duties of the commune in regard to education should be carefully defined by law. The changes made, however, were not of much practical importance.

The law of 1857 granted "liberty of instruction;" still requiring from the private teacher the certificate of competency, it rid him of the veto of the municipality and the inspector. It expressly prescribes that primary schools, in each commune, shall be at the commune's charge; they are to be in sufficient number; and the states' deputies and the supreme government are to judge whether, in any commune, they are in sufficient number or not. If the charge of its schools is too heavy for a commune, it receives a grant in aid, of which the state and the province each contributes half; but there is no fixed point at which the commune can demand this aid. The law fixes the minimum salary for a schoolmaster at 400 florins (about £34); for an under-master at 200 florins. (The schoolmaster's salary, however, is usually much higher; in towns, not unfrequently four times as much.) It provides that when the number of scholars exceeds 70, the master is to have the aid of a pupil-teacher; when it exceeds 100, of an under-master; when it exceeds 150, of an under-master and assistant; for every 50 scholars above this last number, he is allowed another pupil-teacher; for every 100 scholars, another under-master. School-fees are to be exacted only of those who can afford to pay them; and the municipalities are enjoined to "provide as far as possible for the attendance at school of all children whose parents are in the receipt of public relief." The law defines the subjects of primary instruction as follows: Reading, writing, arithmetic, the elements of geometry, of Dutch grammar, of geography, of history, of the natural sciences, and singing. There is still a competitive examination for the office of public schoolmaster; a list of those who have acquitted themselves best is made up by the inspector and a committee of the communal council, and from this list the selection is made by the whole body of the council. For the provincial commission, consisting of the inspectors of the province, there has been substituted a salaried provincial inspector; and the provincial inspectors are assembled once a year to deliberate upon the state of primary instruction. The minister of the home department, assisted by a referendary, is the supreme authority in matters connected with education.

Upon the subject of religious instruction, the law was left unaltered. The enactment of 1857 provides as follows: "Primary instruction, while it imparts the information necessary, is to tend to develop the reason of the young, and to train them to the exercise of all Christian and social virtues. The teacher shall abstain from teaching, doing, or permitting anything contrary to the respect due to the convictions of Dissenters. Religious instruction is left to the different religious communions. The schoolroom may be put at their disposal for that purpose, for the benefit of children attending school, out of school-hours." This was the conclusion arrived at, after much excited discussion.

In 1848, all religions were, in Holland, placed by the law on a perfect equality; and immediately thereafter, an attack was begun by the Roman Catholics on the religious instruction of the schools. Professedly neutral, they maintained that it was really Protestant, and probably they were right. The schoolmasters, on the demand of the Roman Catholics, were enjoined to comply mere strictly with the law; and thereupon there began among the orthodox Protestant bodies a violent agitation against the law—a movement for connecting every public school with some religious communion. The Roman Catholics, believing that in Holland neutral schools must be Protestant, desired that the instruction should be purely secular; and a considerable party among the Protestants contended for the same object. The only party in favor of the existing law were the rationalist or new-school Protestants, who attach more importance to the moral and civilizing side of Christianity than to its dogmatic aspects. Between the benominationalists on one hand and the secularists on the other, the victory fell to this last party. Of course, the decision was a compromise; and neither the high Protestant party nor the Roman Catholics regard it with satisfaction. The consequence has been that, advantage being taken of the newly-conceded freedom of instruction, there has been a great increase in the number of private elementary schools conducted on the denominational basis. The non-denominational school in Holland cannot be considered entirely successful, since the opposition to it seems to be leading to primary education being to a considerable extent taken out of the control of the state.

State Education in Switzerland.

In no part of Europe has the education of the people been more successfully prosecuted than in Switzerland. In all the cantons, French and German, it has been carefully attended to by the governing bodies; and for small communities, provided the rulers have intelligence and public spirit, it is comparatively a simple and easy task. To those who are interested in school-methods and school-management, nothing can be more instructive than the education of the German cantons. Their primary schools are unsurpassed; those of the canton Aargau have a reputation of being the best in Europe. The experience of the French cantons throws light upon more than one of the questions which occur in the construction of a national system. It is with the latter class of questions that we are concerned; and to the French cantons—Geneva, Vaud, Freiburg, Neufchatel, and Valais—the following statement is confined.

In these five cantons, the school-system was, until recently, the same in its main outlines; it was a system designed to put public education in harmony with the democratic constitutions established after the war of the Sonderbund. In Vaud, it was founded in 1846; in Geneva and Freiburg, in 1848; in the Valais, in 1849; and in Neufchatel, in 1850. In Freiburg, it underwent modification in 1856. Its main features were as follows: The communes were required to provide and maintain public schools, the state assisting them when the charge became too heavy. In general, every place with more than 20 children of school-age was required to have its school; every place with more than 50 or 60, a second school; and so on. Infant-schools were recommended and aided by the state, but their establishment was not made obligatory. The council of state—the supreme executive—of the canton appointed a board of public instruction to exercise the government of education; but in important matters, an appeal lay from this body to the council; and by the council only could a master be dismissed. The municipality appointed a communal school-committee, which had the local superintendence of the schools. Ministers of religion were eligible for this body, but were not members of it by virtue of office. It was the duty of the school-committee to visit the schools of its commune not less than once a fortnight, besides holding a public general examination of them once a year. The teacher required to get a certificate of capacity; the examinations for the certificate being under the management of the board of public instruction. In Vaud, however, five years' service in a public school exempted a teacher from the obligation of a certificate; and in other cantons, it does not seem to have been rigidly insisted on. For vacant masterships, there was a competitive examination, to which persons qualified by certificate or service only were properly admitted; in Vaud, however, failing qualified persons, other candidates might be admitted to examination, and provisionally appointed. In Geneva, Freiburg, and Valais, there were school inspectors who periodically reported to the board of public instruction; Vaud and Neufchatel had no inspectors; the duty of inspection in these cantons devolved upon the school-committee. The subjects taught were religion, reading, writing, grammar, arithmetic and book-keeping, geography, Swiss history, and singing. The instruction given had two or more degrees (in Geneva, six degrees), according as these subjects were taught with more or less extension; instruction in both degrees being usually given in the same school, and by the same master. Education was to be based upon the "principles of Christianity and democracy." Hours were to be set apart for religious instruction; from the ordinary school-lessons dogma was to be strictly excluded; and it was regarded as the province of the minister of religion, not of the schoolmaster, to give religious instruction, though the latter was not prevented from giving it in the room of, and under the responsibility of a minister. In all the cantons, except Geneva, educations was made compulsory; attendance at school was required from the 7th to the 15th, or from the 8th to the 16th year. If children were privately educated, the state must be satisfied that their education was sufficient; such children could be called up for examination with the scholars of the public schools, and if found inferior, might be transferred to a public school. A certificate of emancipation was granted when the obligatory course had been fulfilled. The law contemplated that the instruction should be gratuitous, and in Geneva and the Valais it was gratuitous.

In Freiburg the school-system was framed in no small degree for the purpose of strengthening the democratic party against the clerical party. It provided that no religious society should be allowed to teach; that persons educated by the Jesuits should be incapable of holding any office in church or state; it imposed a political oath upon the schoolmaster; it prohibited children from being sent to a private school, except with the sanction of the inspector and the school-committee; and if sent, required that they should come up for examination every half-year. At the same time it established an excellent programme of primary instruction. At the elections of 1856 the clerical party regained the ascendency in Freiburg; and in Jan., 1858, the council of state made a considerable alteration in the school-law. It reduced the programme of primary instruction; it made the clergyman a necessary member of the local school-committee, freed the teacher from the necessity of taking an oath, and relaxed the obligation of attendance at the public schools, giving parents liberty to educate their children at home or at private schools. In other respects, the system, as above described, has been maintained in Freiburg. There has been no change in the other cantons.

The law as regards religious instruction seems to work with tolerable smoothness. In Vaud, it appears that the laxity which prevails as to the requirement of a certificate sometimes leads to the admission of unqualified persons as teachers; and in Vaud and Neufchatel, complaint is made of the incapacity of the school-committee to make up for the want of professional inspection.

In the 4 cantons in which education is by law compulsory, the school-attendance is found to be no better than in Geneva, where it is not compulsory. In these cantons, the law provides that parents not sending their children to school are to be warned; if the warning be neglected, that they are to be summoned before the tribunals, which can punish them by fine or imprisonment. But it appears that, in point of fact, the tribunals are never resorted to; and that the authorities are careful not to insist upon more than the people are easily able and willing to comply with. In the Valais the school-year need not last for more than 5 months. In Freiburg the vacation may last for 3 months; and the inspector may exempt from attendance at school children who are sufficiently advanced, and children whose labor their parents cannot do without. In Vaud, the local school-committee may grant to children above 12 years of age, whose labor is necessary to their parents, dispensations which in a great measure exempt them from attendance at school; the master may grant the scholar leave of absence for 2 days in the week; the president of the school-committee may grant him leave for a week at a time; the school-committee itself for a month at a time. It appears that in Vaud, the attendance at the schools had been steadily falling off from 1846, the date of the law, up to 1858; and the attendance of the children whose names were on the books was then reported to be by no means regular. New branches of industry which gave employment to children had been introduced into the canton; and the council of public instruction seems to have been compelled to sacrifice the law to the interests of families. The experiment of compulsory education cannot be said to have succeeded, because it has not really been made, in French Switzerland.

State Education in France.

At the head of the education of France is the minister of public instruction; he is advised and assisted by the imperial council of public instruction, a body the members of which are appointed by the crown for the period of a year. The minister, if he thinks fit, brings before the council for discussion projected laws and decrees on public education; he is bound to consult it respecting the programmes of study, methods, and books to be adopted in all classes of public schools. The minister has succeeded to the functions in respect of education which, under the first empire, were conferred upon the university of France; he is head of the university, the officials of which still perform a considerable part in the management of education, but do so under his control. As respects the higher and the professional education, the university is both a teaching and an examining body, granting degrees under conditions prescribed by the minister and council. The administration of the secondary instruction is committed to it, and it shares in the supervision of the primary instruction. It is composed of 18 *academies*, each of which comprehends several departments. These academies are so many local centers of the department of public instruction. At the head of each is a rector; the chief officials under him are called academy inspectors. The minister of public instruction is also rector of the academy of Paris.

The academy officials, under the control of the minister, have the superintendence of secondary instruction in the departments within the academy's jurisdiction; there is an inspector for each department. The instruction is minutely regulated, as to the quantity to be provided, as to the subjects to be comprehended in it, and as to its cost; it is the chief duty of the academy inspectors to see that the requirements with respect to it are complied with. The inspection is said to be highly efficient. The lyceum is the principal seminary of secondary instruction; in general the chief town of every French department has its lyceum. There is, besides, the communal college. Every town of considerable population has its communal college. The lyceum is founded and maintained by the state, with aid from the department and the communes; the communal college is founded and maintained by the commune, with occasional aid from the state. The instruction given in the communal college and in the lyceum is substantially the same in character; in the lyceum it is the more extensive. To the lyceum there is usually attached a preparatory school for the younger boys. In both lyceums and communal colleges there are boarders and day-scholars. French, Latin, Greek, and mathematics are the principal subjects of instruction; arithmetic, history, geography, modern languages, and the natural sciences are also taught. The course at the lyceum lasts for six years, and qualifies for the degree of bachelor of letters. Religious instruction is given—to the Roman Catholic boys by chaplains attached to the school; to the Protestants, by a Protestant minister specially appointed to this duty; and the New Testament in Greek or Latin is read daily by every class. In the lyceums, the average charge for day-scholars is from 110 francs (£4, 7s. 4d.) to 180 francs (£7, 8s. 4d.) a year; the charge for boarders from 800 francs (£32) to 900 francs (£36), according to their age and advancement. In Paris, the charges are higher—from £38 to £60 a year for boarders, and from $6 to £12 a year for day-scholars; on the other hand, there are lyceums where the highest charge for boarders is £22 a year. There are public scholarships (bourses) founded by the state, to be obtained by competition, the holders of which are relieved from all cost. The education given is in no respect much inferior—and in some respects it is superior—to that which is to be had at an enormous cost at the best English public schools; it is far superior to that which, at a far higher cost, is ordinarily given to children of the middle classes in England. A private secondary school cannot be opened without notice to the public authorities: they must be satisfied that the premises are suitable; and the director must have a certificate of probation—showing that he has served five years in a secondary school—and a certificate of competency obtained at the public examination for secondary teachers. The academy inspector inspects private secondary schools, but only to see that the pupils are properly lodged and fed, and that the teaching contains nothing contrary to morality and the laws. The minister may, however, dispense with the certificate of probation, and holy orders are accepted in lieu of the certificate of competency.

A law, dated June 21, 1865, founded a new course of study in secondary schools—a special secondary instruction. The object of the special secondary instruction is declared to be to "found the sub-officers of industry;" instruction in living languages is substituted for the classical instruction of the secondary schools; the elements of science and its applications receive great attention—particular regard being had to the teaching of agriculture and the sciences which bear upon it. The teaching, moreover, is intended to impart what may be called a sound French education. A normal school has been founded at Cluny for the preparation of masters for this special secondary instruction.

For primary instruction in France an excellent basis was laid by M. Guizot's law of 1833, of which, indeed, the more important provisions have been retained. Since the re-establishment of the French republic education has repeatedly been the subject of legislation; in the main, the provisions as to primary education are regulated by the laws passed between 1850 and 1867. Every commune must maintain an elementary school, either by itself or in combination with other communes; in founding and maintaining its schools it is to be aided, if necessary, by the department and by the state. It must have taxed itself specially for the schools three centimes per franc of rental before it can claim aid; the department must have taxed itself specially two centimes for the communal schools before the state is resorted to. Up to the present year a certain number of poor children—the number determined for each school by the prefect of the department—were admitted to the school gratuitously; for others a fee was charged, which was collected every month by the tax-gatherer. The state contributed whatever was necessary in addition to the communal and departmental taxation and the school-fees. The law of the present year, however, provides that all children are to be admitted gratuitously whose parents would have difficulty in paying the school-fee; and that a commune whose taxation amounts to four centimes additional may dispense with the school-fee altogether, the deficiency, if any, so arising being made up by the state. In the large towns the schools have long been gratuitous—the communes often taxing themselves for school-purposes beyond the amount required by law. Up to the year 1867 the law did not oblige the communes to maintain separate schools for girls, though a large proportion of them contributed towards the maintenance of such schools. The law of 1867 provides for the establishment of girls' schools; the cost of them—the communal and departmental taxation being in most places previously exhausted—will fall in a great measure upon the state.

Religious instruction is given in every school. In France, the Roman Catholic, the Protestant, and the Jewish forms of worship are subsidized by the state; and it is provided that, in communes where more than one of these is publicly professed, each form is to have its separate school. The departmental council, however, has power to authorize the union, in a common school, of children belonging to different communions. For such cases, it is provided that ministers of each communion shall have free and equal access to the school, at separate times, to attend to the religious instruction of members of their own flock. To a school appropriated to one denomination, no child belonging to another is admitted, except at the express demand of his parent or guardian, signified in writing to the teacher. Denominational schools are now the rule, common schools the exception. Previously to 1850, under M. Guizot's law, common schools were the rule, but it was found that in them the religious instruction presented grave practical difficulties. All the religious bodies appear to be satisfied with the present system. The schools, though denominational, are communal schools; the denominations have not the management of them; and they are all subject to the same inspection.

The mayor and the minister of religion in each commune have the supervision and moral direction of the primary school; in practice they are strictly confined to matters connected with its morality. Cantonal delegates are appointed by the departmental council (the canton is a division larger than the commune), who inspect the primary schools of their canton; but they have no real authority over the schools; they are only allowed to make representations as to the state of the schools to the departmental council, or to the inspector. The departmental council has the chief part in the regulation of the primary schools; moreover, no private primary school can be opened without its permission; and if it refuse permission, there is no appeal. It is the prefect, however, who has the power of nominating, suspending, and dismissing public primary teachers. His authority is usually exercised upon the report of the academy inspector—the university official whose important functions, in respect of secondary instruction, have already been described. The academies have the charge of the normal schools of primary instruction, and the supervision of the primary schools as regards the methods of teaching and course of study. Under them are the primary inspectors, who report to the academy inspectors; above the latter, as regards primary instruction, there are four inspector-generals, attached to the office of education at Paris. It is the primary inspector who really superintends the instruction of the schools; his labors are unceasing, his inspection is a reality, for he is not required to give notice of his visits. The private primary schools are subject to his inspection, but only as regards the provision made for the bodily health and comfort of the pupils and the maintenance of morality.

The subjects which must be taught in every primary school, in addition to moral and religious teaching, are reading, writing, arithmetic, the elements of French grammar, and the French system of weights and measures; there are other subjects which are facultative—which, in whole or in part, may be taught, that is, if the council of the commune should so desire, and the departmental council give its consent. These facultative matters are the applications of arithmetic; the elements of history and of geography; the elements of physics and of natural history; elementary instruction in agriculture, the arts, and hygiene; surveying, leveling, drawing, singing, and gymnastics. For girls, there are superior primary schools which teach the facultative matters only; and in girls' schools instruction is usually given in needle-work for about three hours a day.

For the preparation of male teachers, the law requires every department to maintain a normal school; in some cases, however, two departments are allowed to maintain one jointly: there are now 70 of these schools. There are separate normal schools for female teachers; of these, the number was recently 84; now that the law is about to add largely to the number of girls' schools, it will probably be increased. The members of the religious orders devoted to teaching, which perform a great part in primary education, are trained for their duties in the establishments of their respective orders. (Of these orders, the most important is that of the brethren of the Christian schools.) The instruction of the normal schools is meager; it scarcely exceeds the subjects of primary instruction; a considerable proportion of the students, indeed, acquire only an imperfect knowledge of the facultative subjects. School-method is what, in the normal schools, it is deemed most important to teach. The examination for primary school-masters—which is conducted by a commission appointed by the departmental council—is limited to the subjects taught in the schools. There are two classes of certificates, according as the teacher passes in the obligatory subjects only, or in the whole or part of the facultative subjects also. Every male teacher, public or private, is required to have the certificate of capacity granted after an examination; also, excepting in the case of religious persons, a certificate of morality. The law recognizes a certificate of stage, to be granted to assistants who have served as such for three years, as a substitute for the certificate of capacity, but this provision has been unpopular, and the qualification of stage is practically unknown. Female lay teachers require the certificate of capacity; female teachers of the religious orders are exempt from it. No person can be appointed a regular communal teacher unless he be twenty-four years old, and have served for three years since his twenty-first year as an assistant, or as a *supplying* teacher. The supplying teacher gets a lower salary, and may be employed in the poorer communes. The salaries are low even in the towns: in many of the country communes, the legal minima are not exceeded: these are—for an ordinary communal teacher, £24 a year; for a female teacher, or a supplying teacher, £20 a year. The commune pays £8 a year, besides the school-fees; whatever is required to make up the legal minimum, the government supplies; and, since 1862, the government has, upon certain conditions, made slight allowances in addition to the minimum.

It is in secondary instruction that the education of France has a decided superiority over that of England. The primary instruction is scarcely equal to that given in English schools of the same grade. Mr. Matthew Arnold has reported that, in 1859, he found in French primary schools the writing fair, but scarcely so good as in English schools; the reading better, the arithmetic much better, than in English schools. Of history and geography, the pupils were far more ignorant than English school-children of the same age. The ministry of M. Duruy, however, was an era of marked improvement; much more attention is given to the facultative matters now; especial attention to agriculture and the subjects connected with the daily life of the peasant. Mr. Arnold came to the conclusion, that even in the great towns there were no masses of children left altogether uneducated, that almost all passed at some time through the schools. Adult classes, taught in the evenings, have greatly increased in numbers of late years, and are now aided by the state.

In 1834—just after the passing of M. Guizot's law—the number of primary schools, public and private, was 10,316; in 1857 it was 65,100; in 1872 it was 70,180, of which 38,850 were boys' or mixed schools, 17,460 girls' schools, and 11,000 were free schools. In the primary schools alone there were, in 1872, 4,722,000 scholars—3,500,000 more than the number of scholars in 1829. In 1872, the year of the census, a careful inquiry was made into the condition of the French people with regard to primary education. Of the total population above the years of childhood, it was found that 80.77 per cent could neither read nor write, 10.94 could only read, and but 58.29 could do both. There was a most extraordinary difference between one department and another in this respect, the percentage of utterly illiterate persons ranging from 6.9 per cent in Doubs to 61.8 in Haute-Vienne; the most favorable figures indicating universally the north-eastern departments. In 1872 the state and the communes expended 85,000,000 francs on primary education alone. The item of public instruction stood at 49,211,000 in the budget of 1877. For the means of higher education in France, see UNIVERSITY OF FRANCE.

State Education in Prussia.

In all the Protestant states of Germany, the school-system in its main features is the same. The Prussian system—more celebrated, more extensive, more practical and thorough than the system of the minor states—always powerfully influencing these, and now likely to influence them more than ever, is that which must be selected for description. About this system, M. Cousin, by a strange confusion between it and a project of law—a mere scheme drawn up by the education minister, Von Altenstein, never even proposed for legislation—spread misconceptions throughout Europe, which have scarcely yet been dispelled. It has been greatly changed, greatly improved since Cousin wrote in 1831; but it does not yet in symmetry and completeness approach to what he described.

In Prussia, there is a minister of public worship and instruction; but the officials who under him carry on the government of education are the officials of the department of the interior. At the head of the government in each province is a president; over each of the departments into which the province is divided there is a prefect (*bezirk*); each of these officers is assisted by a council, of which one section, called *schulcollgium*, forms a separate council for deliberating upon the local school affairs. One member of the school council, called provincial school-councilor, is associated with the president for administrative purposes: the prefect has attached to him two departmental school-councilors, one Protestant, one Catholic, to advise with him, and to adminster the school-affairs of their respective communions. There is practically a division made of educational affairs between the officials of the province and those of the department. The provincial school-councilor takes the charge of secondary education within the province; the departmental school-councilors the charge of the primary schools of the department.

Over each of the circles into which the department is divided is an office, termed a *landrath*, who reports to the prefect of the departments. With the landrath, in the management of primary schools, is associated the *superintendent*, the church dignitary of the circle. The superintendent is *ex-officio* inspector of the primary schools within the district. The parish clergyman is *ex-officio* local inspector of primary schools within his parish. There is also for the school or schools of each parish a board of managers, the composition of which varies in different provinces. The clergyman is always a member of it: he is usually chairman. In country places, the whole powers of the board are often left in his hands.

In the "exterior" affairs of the school—passing school-accounts, visitation of school-premises, control of the school-estates, adjustment of the school-rate, etc.—the landrath is associated with the superintendent. Its "interior" affairs, all that concerns its teaching and discipline, are subject to the established regulations, under the superintendent's control; but, in practice, they are more under the influence of the departmental school-councilor. The superintendent, however, is required to visit the school, and to watch over the conduct of the local inspector, and he reports annually to the government of the department. The local inspector's province is the interior affairs of the school. He is expected to visit the schools diligently, and to be active in the supervision of them. The religious teaching of the children is almost entirely done by him, it being his duty to prepare them for confirmation, which comes at the end of the school-period. To qualify them for the duty of school-inspection, the candidates of theology are required to attend for six weeks as auditors at a normal school, and to have attended a course of *pädagogik* at the university. Nevertheless, it appears that many clergymen are very ill fitted for this work, and that their powers of interference are often exercised in ways annoying to the master, and detrimental to the school. The "exterior" affairs of the school of a parish belong to the board of managers.

This board is usually composed of representatives (1) of the patrons, if any, of the school; (2) of the parochial clergy; (3) of the municipal body; (4) of the householders. It has a stated meeting once a quarter; it meets whenever it is summoned by the chairman. It manages the revenue and expenditure of the school, in respect of which it is responsible to the landrath; it is the trustee of the school-buildings and property. It is its duty to see that the regular school-hours are kept; that no unauthorized holidays are given; to it application must be made for dispensations for periods exceeding a week. Its members should be present at all examinations and other public solemnities of the school. In the large towns there are school-delegacies appointed by the *magistrat*, whose powers are more extensive, and are in practice the greater, because in the large towns the pastors pay little attention to the schools. The school-delegacies have control over the higher as well as the primary schools which their constituents maintain; two paid members—school-delegates—who must be members of the *magistrat*, exercise the greater part of their authority. Under the delegacy, for every school there is a school-board, consisting of the clergyman and two lay members, whom the delegacy appoints. The delegacy itself is accountable to the magistrat, and both are subordinate to the provincial council.

Every commune is bound to find school-room and teachers for all the children of school age belonging to it. The amount of the teacher's stipend is in every case fixed by the departmental government: there is no legal minimum; the salaries are usually very low. Some parishes possess endowments; but, in general, the cost of maintaining the schools is defrayed by means of (1) school-fees; (2) a local rate; (3) a grant from the national treasury. As children are only expected to pay what they can, and as the state grants aid only after the strictest proof of the incapacity of the commune, the weight of the burden falls upon the local rate. The maintenance of the schools ranks with the first charges upon the local purse. The teacher is appointed by the departmental councilor; in a few towns, however, a certain power of choice is allowed to the municipal authorities—they may select one from a number of candidates presented to them by the government.

School-attendance is by law compulsory for eight years; the school age beginning at the completion of the fifth year. But in most parts of Prussia, children, though allowed, are not compelled to attend till the completion of their sixth year. The school-period closes with confirmation. A register of all children of school age is made up—usually at the police office; every child is registered for a particular school; there, whatever his rank, he must attend, unless a dispensation be got for him from the landrath. When a dispensation is applied for, the parents must state the motives of the application, and the provision to be made for the child's education. All persons officially connected with schools are expected to use their influence to secure regular attendance; but failing moral suasion, there are other means of enforcing it. The school-master keeps a list of absences, excused and inexcused. When a child's attendance is irregular, the board of managers admonishes its parent. If admonition—which in general is repeatedly resorted to—has no effect, a statement is sent to the police office; the parent is fined a small sum for each day of the child's absence since the last admonition; and the fine can be levied by execution, enforced by imprisonment, or taken out in parish labor. It seems that very few children escape registration; but the regularity of the attendance—in general it is very regular—varies considerably in different districts; the execution of the law being strict or otherwise according to the temper of the people, their circumstances, and the vigilance of the school-authorities. There are no statistics by which the success of the law can be exactly tested. In some of the larger towns the demand for child-labor and the growth of pauperism are adding to the difficulty of enforcing it. Prussia has a factory-law requiring that every child employed in a factory shall attend school for three hours a day, and this law is strictly enforced.

Teachers of every class, public and private, have to pass two examinations. Certificates are of three degrees of merit—they may be marked "very well qualified," "well qualified," or "sufficiently qualified." The heads of examination are "religion, the German language, the art of school-keeping, geography of Prussia, arithmetic and geometry, knowledge of natural objects, writing, drawing, singing, and the theory of music, organ." After the first examination the candidate is eligible as an assistant or provisional master; he must serve in this capacity for three years before taking the second; he must pass the second within five years. The second examination is in the same subjects; but now most weight is given to the art of school-keeping. Of the subjects taught in primary schools the principal is religion; the others are reading, writing, arithmetic, singing, and the elements of drawing. Incidentally, the teacher may communicate information about natural phenomena; about geography, beginning with that of the locality, and the history of Prussia. The teaching was much more ambitious before 1854; before 1854, also, the normal schools, now limited to a meager programme, were universities on a small scale, aiming at the mental training of their students, rather than at fitting them to teach elementary schools. The change is often ascribed, both in Prussia and out of it, to political motives, having been made by a party unfriendly to popular education; but eminent educationists defend and approve it. The schools, they say, are now attempting as much as can be thoroughly done in the time allotted for primary education, and are doing it thoroughly; while the showy teaching of former times, with its endeavor to develop the faculties, and to communicate knowledge, neglected the indispensable elementary instruction, and, as regarded the greater number of the scholars, was in no respect successful. The normal school training, it is said, now fits the teacher for his duties and his position in life; formerly it rather unfitted him for them, while fitting him perhaps for something better. It is, however, admittedly a defect in the Prussian system that it offers to the humbler classes no opportunity of carrying their education beyond the point at which the elementary schools leave it. In some of the towns there are improvement institutes, where young persons are taught in the evenings or on Sundays; but they attempt little, are badly organized, and are neglected by the school administrations. It should be stated that the town schools often teach somewhat more than is taught in country places—more geography, history, and natural knowledge—but this, though permitted, is not encourged by the authorities. Grammar is entirely excluded from primary instruction. The only part of the teaching which is less than excellent is the writing: it has been stated that upwards of 50 per cent of the recruits are unable to write—the art, never perfectly mastered, being lost, it must be supposed, through want of practice.

As regards religious instruction, the rule is that the primary school is denominational—public schools are set apart, that is, for children of each of the religious bodies; the clergyman who has the charge of the school is the clergyman of the body to which it is appropriated. Besides the "evangelical establishment," in which Lutherans and Calvinists are combined, there are the Roman Catholics and the Jews to be provided for; of other sectaries, there are not 10,000 in all Prussia. The Lutherans and Cavinists are combined in the school as in the church. Dissenters are allowed to withdraw their children from the religious instruction, and have it given by their own pastor. Any commune may establish a mixed school, if it so desire, and if the authorities permit; but, in practice, mixed schools are only to be found where it would be very inconvenient to establish a school for each body. In mixed schools the teacher are chosen proportionately from each of the two great religious bodies; if there be only one teacher, it is, in some districts at least, customary that he should be alternately a Protestant and a Catholic. The experiment of mixed schools had a long trial in Prussia, and was found to be unsatisfactory, leading to attempts, or suspected attempts, at proselytism, and to parish squabbling. It has been abandoned, not so much from the wish of the government, as in deference to the feelings of the people, and to the demands of the Roman Catholic hierarchy. But the denominational system is more in accord with the part which the state assigns to religion in the school. The school, it is said, should be the organ of the church for training children to church-membership; school and church are expected between them to form the child into a man contented with his position in life. Religious teaching must be given by the master for an hour every day. In the Protestant schools the master teaches the Lutheran catechism to Lutheran children; the Heidelberg catechism to the Reformed children. Scripture history is also taught; and hymns, from a prescribed collection, have to be committed to memory. The master is not allowed to expound the catechism; his duty is to see that the children learn it and understand the words in which it is expressed. It is the clergyman who explains its doctrines to the elder children in preparing them for confirmation.

Any one may open a private school of any class in Prussia who can obtain a license for the purpose from the government; but in a city it must be shown that the district in which the school is to be placed is insufficiently supplied with schools; and every private teacher must have passed the two examinations. Private schools are subject at all times to the inspection of the school-councilor, and are bound strictly to follow the regulations established for private schools. The larger towns in Prussia are not yet adequately supplied with public primary schools; private primary schools are therefore common in such places: in Berlin they educate nearly half the children who are in primary schools.

Of the secondary and higher education in Prussia, a brief and general notice must suffice. It has already been stated that the superintendence of the secondary schools is undertaken by the school-councilor of the province; it is independent of ecclesiastical control. The larger communes and the towns are required to maintain middle schools, giving instruction of a higher order than is given in the elementary schools, a sound German education, and preparing boys for the gymnasia. These must be provided to the satisfaction of the authorities, according to the wants of the population. They are maintained, like the primary schools, by school-fees, local taxation, and these failing, the state treasury. Some of the larger towns maintain also secondary schools of a higher class; these are of two kinds—the real-school, and the gymnasium or grammar-school. In such towns, as stated already, the local management rests with the school-delegacy. There is, besides, a considerable number of real-schools and gymnasia which are entirely in the hands of the government. None of the real-schools take boarders; very few of the gymnasia do so. The gymnasium is a classical school preparing for the universities. In the real-school, mathematics, scientific studies, and modern languages are substituted for the classics, and the instruction is designed to prepare the pupils, as far as possible, for the pursuits of life. The real schools grant certificates to their pupils. The royal real-schools and the gymnasia (other than those maintained by the large towns) are under the management of the provincial school-councilor. Some of the older of those gymnasia have endowments, but the money necessary for their support is contributed by the state. Appointments to the schools are made by the school-councilor; he appoints the teachers, or nominates the leet out of which local authorities have to choose, in all the secondary schools. Teachers for all the schools have to pass two examinations. There are boards of examiners, appointed by the provincial government, which conduct the examinations; these boards also examine the students of the gymnasia, to test their fitness for the university. The university in Prussia is a teaching (or rather a lecturing), as well as an examining body, and grants degrees in four faculties—theology, jurisprudence, medicine, and philosophy. There are seven universities within the territory held by Prussia before the war of 1866; in two of these—Breslau and Bonn—there is a Roman Catholic as well as a Protestant institute of theology. The university affairs are administered by a commissioner appointed by the crown; all their regulations are prescribed, and all the appointments in them made by the state.

State Education in the United States.

In the United States, the education of the people is out of the sphere of the central government; it ranks among the domestic affairs of the several states, and it is chiefly in the northern states—those from which, before the late war, slavery was excluded—that systematic attempts have been made to promote it. The central government has, however, in more than one instance endeavored to assist education in the states, by providing for it endowments. In the states which contain waste lands, it puts aside, in every newly-surveyed township of six miles square, one sq.m, for the support of schools within the township. The state becomes trustee of this land, or of the price obtained for it, which is usually called the township-fund, and pays over the yearly income to the township when it has been settled. The central government, about 1836, had accumulated in its treasury a considerable balance, the surplus of its income over its expenditure during several years: this it apportioned *pro ratâ* among the states, reserving the right to reclaim it. This right has not been, and is not likely to be exercised; and in most of the Northern states, the income of the "United States deposit-fund" is applied to the support of education. Since 1834, by what is called the "agricultural college act," the central government has made a liberal offer of allotments of land to the states upon certain conditions, for the endowment of one or more institutions in every state, in which—whatever the other instruction may be—special attention shall be given to those branches of learning related to agriculture and the mechanic arts. Several states are preparing to avail themselves of this offer.

Every one of the northern states has its common schools. Before the war, Kentucky, Missouri, and Louisiana had each some kind of school-system; at various points throughout the south, particular towns had established schools, always after the model set in the northern states. The new state of Western Virginia has passed a school law since the conclusion of the war. In the northern states, besides the endowments above described—both of which are possessed by most of the states—every state possesses a school-fund arising from various sources—sale of lands, taxation, penalties, and forfeitures—which is usually vested either in the state legislature or in a board of education. In one or two of the states, the income of this fund is considerable, but in general it is small. It is usually, but not in all the states, applied solely to the support of public schools, or of the normal schools which help to provide them with teachers. Apart from the influence exercised by means of this fund, the state usually promotes public instruction only by its legislation, by which it requires or enables local bodies to make certain provision for the education of children within their jurisdiction. Everywhere, the law leaves much, and usually the practice leaves everything, to the local bodies; and these come short of, or exceed the legal requirements according to the local interest in education and ability to pay for it. It is through the interest of the municipalities in education that very ample provision is made in the towns; it is through the force of example, and in deference to educational experience, that a certain uniformity of system prevails. There is a close approach to uniformity both in the law and in the practice of the several states; and a description of the system of one state will be approximately true of that of other states. The Massachusetts system is fittest to be selected for description, as being the oldest, the most celebrated, that which on our side of the Atlantic is most identified with the common schools, and perhaps on the whole the most successful. Some of the principal variations from it will be noted.

In 1642—20 years after the landing of the *Mayflower*—the Massachusetts colonists passed a law requiring every citizen, under a penalty of 20s., to teach his children and apprentices, or have them taught, to read perfectly the English language. Five years later, they passed another law, requiring, under penalty, every township containing 50 householders to support a teacher to teach their children to read and write; requiring every township containing 100 householders to maintain a grammar school capable of fitting youths for the university. The present law is different, if not less liberally conceived. The change was made by numerous steps, and was probably forced on by the circumstances of the community. The law, as it now stands in the revised statutes of the state, provides that in every township the inhabitants shall maintain for at least six months in the year a sufficient number of schools for all the children of the township. The teachers are to be of competent ability and of good morals, and they are to teach orthography, reading, writing, English grammar, geography, arithmetic, the history of the United States, and good behavior. Other subjects—algebra, vocal music, drawing, physiology, and hygiene—are to be taught or not at the discretion of the local committee. Every township may, and every township containing 500 householders must, also maintain for ten months in the year a school which shall give instruction in general history, bookkeeping, surveying, geometry, natural philosophy, chemistry, botany, the civil polity of Massachusetts and of the United States, and the Latin language. And in every township containing 4,000 inhabitants, the teacher must be competent to instruct in the Greek and French languages, in astronomy, geology, rhetoric, logic, intellectual and moral sciences, and political economy. Moreover, any township may establish schools for children over 15 years of age, determining the instruction to be given, and appropriate money for their support. The compulsory part of the law is supported by penalties, but it is said that there would be difficulty in enforcing them; at any rate, they are not enforced. It is also provided that every child between 8 and 14 must be sent to school for at least 12 weeks in a year: the penalty for breach of this provision is $20, but the idea of enforcing it seems never to have been entertained; its existence even is not generally known. The law does not permit school fees, or, as they are called in America, rate-bills. There seems to be no fund arising from waste lands in Massachusetts; and the township raises the necessary funds by a tax upon property—the personal property of the inhabitants and the capitalized value of their real property situated within the township. The amount of the rate is by the law left wholly undetermined: it is determined by the householders at their annual meeting. The state endeavors to influence the townships to make a liberal provision by means of the school fund, a share of which is given to every township which has made its returns to the board of education, and has spent not less than at the rate of $1½ per head for all the children of the township. The school-fund contribution is very small—less than 25 cents for every child; but it is said to have an excellent influence upon the rural townships. No doubt, the publication of the returns made to the board of education tends to spur on the backward districts.

The management and control of all the public schools of a township are placed in the hands of a school-committee, consisting of any number divisible by three; the members of this committee hold office for three years, and one-third of them are elected annually at the annual meeting of the township. The committee have the supervision of the schools; and it is among their duties to see that no book calculated to favor the tenets of any particular sect of Christians shall be used in the schools, and to require the daily reading of some portion of the Bible in the common English version. Any township by its public meeting, or a city by its city-council, may require the committee to appoint a paid superintendent of schools: when this is not done, the members of the committee receive a small allowance for the time during which they are engaged upon the school-affairs. But, moreover, any township may, at a meeting called for the purpose, resolve to divide itself into districts for the support of its schools. If this be done, the township names for each district a "prudential committee," consisting either of one or of three persons, resident within the district, which is charged with providing and keeping in repair the school-house, at the expense of the district, and, if the township so determines, with the duty of selecting and contracting with the teachers. The district determines the amount to be raised by it for the building or repair or furnishing of its school: this is collected by the township collector, and handed over to the district-committee. The school-committee retains its functions of management, except so far as they have been made over to the districts; and hence, there is a double management of the schools, which is found to be attended with inconveniences. The division into districts, too, is said to have led to an unnecessary multiplication of schools in country places: people scheme to have the township so divided that there may be a school in their neighborhood—there are, therefore, more schools than are needed, and more than can be maintained in efficiency. The school-committee—in cities, the school-superintendent—examines the teacher before his appointment, and grants him a certificate, which remains in force for a certain time. There are three classes of certificate—one valid for six months, another for twelve, a third for two years. The common schools of a township are open to all children resident therein between five and fifteen years of age: none are to be excluded on account of race, color, or religious opinions; and it has been held that a child unlawfully excluded may recover damages therefor in an action of tort.

In New York, in Pennsylvania, and in most of the western states, large municipal powers are possessed by the county, and the county shares with the township the management of school-affairs. New York has a state superintendent, whose power over the schools is considerable. In that state, it is the school-commissioner of the "assembly district" in which the township lies who divides the township into school-districts; and it is the district which determines the school-tax: the township is almost completely ignored. In New York, Ohio, and Illinois, it is by county officials that teachers are examined and certificated. In New York, Rhode Island, and Connecticut, "rate-bills"—that is, school-fees—are allowed, and are usually levied. Several states besides Massachusetts make school-attendance compulsory: in most of the states, there appears to be some provision against "truancy;" but it appears that attempts are not made to enforce the law except occasionally, in the case of homeless, wandering children, who are liable, in lieu of a fine, to be sent to reformatory schools. It has been calculated that in the city of New York (pop. 940,000) there are about 100,000 children who do not go to school—though in no city is there a better or ampler provision of common schools.

As might be expected, the school-laws work badly in country districts. The householders are disposed to be satisfied with any kind of school, provided it be cheap, and within easy reach of them; and the multiplication of schools by the district-system, makes it almost unavoidable that an insufficient sum should be spent upon each school. The teachers—a vast majority of whom are women—being wretchedly paid, are badly qualified; they are constantly changing; scarcely any intend to make teaching their occupation for life. Few of them have been trained for their work—the normal schools which exist being utterly inadequate to supply the demand for teachers; and the examination by a rural school-committee affords but a slender guarantee of competency. The teacher is usually "boarded round" among the farmers of the district, and is said to be treated by them with much observance; but his income—putting a money-value upon the board—has been estimated at an average of about 50s. a month, and that only during the time that the school is open. In 1864, in 84 townships of Massachusetts—more than a fourth of all the townships in the state—the schools were kept open for less than the statutory period of six months. The teaching is said to be wonderfully good, considering the scanty pay given; but where the vacations last for more than six months, and the teacher is changed almost every term, thorough and systematic instruction is scarcely possible. It is in the towns that the working of the school-law has been creditable and successful. Through the high public spirit of the municipal bodies, and the great importance attached to education, the support of the common schools is in general most liberally provided for.

In the towns, there is usually a superintendent of schools, by whom, under and in co-operation with the general and district school-committees, the schools are inspected, and the character of the instruction determined; by him the examination of the teachers also is conducted. Of the schools, there are four classes—primary, intermediate, grammar, and high-schools or academies. Children usually enter the primary school about 5 or 6; the grammar-school between 8 and 9; the high-school between 12 and 13 years of age. They are not promoted from one class of school to another without undergoing an examination; the intermediate schools, where they exist, are intended for those who are too old to be at the primary school, and too backward to enter the grammar-school. To be admitted to a grammar-school, a child must be able to read at first sight easy prose, to spell common words of not more than three syllables, and to have acquired a slight knowledge of arithmetic. For admission to the high-school, the usual requirements are ability to read correctly and fluently, an acquaintance with the simple rules of arithmetic, and some knowledge of geography and grammar. From these tests may be inferred the average proficiency expected to be attained by children leaving the primary and the grammar-school respectively. In the grammar-schools of Boston, the programme of studies consists of spelling, reading, writing, arithmetic with book-keeping, geography, English grammar, the history of the United States, natural philosophy, drawing, and vocal music· this is nearly the usual programme; but in New York and one or two other states a little more is attempted. Between the high-schools or academies in the various states, there are considerable differences. In the city of New York, for example, the Free academy has pretensions to the rank of a university, and grants degrees in arts and science (bachelor of arts, bachelor of science, master of arts) to students who have completed with credit the curriculum of five years. But, in general, the high-schools are schools of secondary instruction, intended to prepare youths for the university—instruction being given in the classical languages, mathematics, the sciences, history, and the English language and English literature. The usual curriculum is one of four years; and the students are not required to study all the subjects taught in the school. At Boston, where boys are admissible to the Latin high-school at 10 years of age, the curriculum lasts for six years. There are high-schools for girls as well as for boys, the programme of instruction being the same in both. At Boston, the curriculum at the girls' high-school lasts for three years; and pupils at admission must be between 15 and 19 years of age. Boston possesses, besides its Latin high-school and its girls' high-school, an English high-school, said to be admirably planned and conducted. The instruction in it closely resembles that given in the real-schools of Germany, including French and German, and various sciences, with their application; being intended to enable boys to complete a sound English education, and to prepare themselves for commercial life. Great complaints are almost everywhere made— Boston seems to be exceptional in this respect—of the irregularity of the attendance at the primary schools. It is estimated that in most states not much more than half of the children pass from these to the grammar-schools; but a trifling proportion of the grammar-school pupils enter the high-schools, and of these, only a small fraction persist to the end of the curriculum. All high-schools grant certificates of graduation to pupils who have creditably gone through the course of study. The study of the classics does not, even in the most pretentious institutions of this class, seem to be carried very far, much more attention being given to mathematics and natural science. In Boston—in many respects the most favorable example that could be taken—there were, in 1864, 32,814 children of school-age—between 5 and 15; of these, 26,960 were in school, the average attendance being 24,617. The number enrolled at the three high-schools was only 725, and the average attendance 691. The number of students who complete the five years curriculum of the New York Free academy seldom exceeds fifty. Among the wealthy, there is said to be a growing disinclination to make use of the common-schools: their children are usually sent to private academies. The only serious opposition to the non-religious character of the common schools comes from the Roman Catholic clergy; but it is stated that there is a growing feeling upon this subject among some of the other religious bodies. In many of the New York schools, in which the majority of the children are Roman Catholic, clerical influence, insufficient to impress upon the education the religious character which it would approve, has obtained, with the tacit assent of the school-authorities, the disuse of the daily Bible reading which the law prescribes.

The primary and grammar schools are most frequently mixed schools—that is, they admit boys and girls; in the teaching, however, the sexes are kept apart. The teachers in primary and grammar schools, even in the towns, are usually women; but in Boston the principal of a grammar-school is always of the other sex. The schools are in towns always *graded*—divided, that is, into classes composed of those who are at the same stage; each grade forms a separate department of the school, and is taught by a separate master. The usual number of pupils allotted to a teacher is in the primary schools about 50; in the grammar-schools about 35. This system of grading is a cheap system, because it enables a teacher to take charge of a large number of pupils; but it is said to lead to a want of thoroughness in the instruction, the teaching being addressed to the class rather than to the individual members of it. Want of thoroughness seems, indeed, the besetting sin of American teaching, which aims too much at communicating knowledge, not sufficiently at developing capacities. In the primary and grammar schools, the education costs from 25s. to 30s. per head; in the high-schools, from £6 to £10 per head.

Statistics of National Education.

The proportion of children attending school—i. e., enrolled in school-registers—to the whole population of the countries under-mentioned may be approximately stated as follows: England, 1 in 7.7; Scotland, 1 in 6.5; Prussia, 1 in 6.27; France, 1 in 9; Holland, 1 in 8.11; Belguim, 1 in 11; northern states of the American union, 1 in 4.5; Switzerland, 1 in 7; the minor Protestant states of Germany, 1 in 6.7 These figures, however, must not be taken as indicating the comparative diffusion of education in the countries named: nor are they to be relied on as indicating, with anything like exactness, the comparative proportions of children actually attending school; for the proportion of the children enrolled which on the average is in actual attendance, varies in different countries. It should also be borne in mind that averages conceal the condition of the worst parts of a country—in Scotland, for instance, where the school attendance varies from 1 in 4 of the population in the best districts to 1 in 15, 1 in 20, and even 1 in 30 in the worst.

See the reports of the assistant-commissioners appointed to inquire into the state of popular education in England, vol. iv., being vol. xxi. part iv. sess. 1861; the second report of the Scottish educational commissioners, 1867; the statistical society's quarterly journal for March, 1867; Horace Mann on education in European countries; Fraser's report on American (U. S. and Canada) schools; Cousin on German and Dutch education; M. Block's abstract of public documents relating to education in France; *L'Instruction du Peuple*, par Pierre Tempels (Brussels, 1865); *Statistiche Nachrichten über das Elementar Schulwesen*, an official return, which gives a complete survey of elementary education in Prussia to the end of 1864; *Conrgés International de Bienfaisance de Londres, Session de* 1862; and *Rapport et Discussion sur l'Instruction Obligatoire.*

[Since the preceding account was written, the claims of national education have been more fully recognized, and, with less opposition than might have been expected, a national system has been established in England and Scotland. The elementary education act for England, 1870, enacts that every district in which the existing schools are found deficient shall have a popularly elected school-board, to manage its rate-supported schools, levy school rates, appoint teachers, etc. Elementary schools are to be supported, and the expenses of school boards paid, out of funds called school-funds. The local rate forms the nucleus of each school-fund; but every school under the act is likewise entitled to an annual grant from parliament not exceeding the income of the school from other sources, and varying in amount according to the number of pupils and their proficency as tested by different standards of examination. Schools are to be open at all times to government inspection. Religious instruction, if given at all—and this is left to each board to decide—is to be given at fixed times other than the ordinary school-hours, when no child is compelled to attend. It is further left to the discretion of school-boards to make education compulsory—The Scotch education act, 1872, differs materially from the English act on three points only; first, by providing that a school-board, under the Scotch education department, is to be elected in *every* parish and burgh; secondly, by making it illegal for parents to omit educating their children between 5 and 13 in reading, writing, and arithmetic; and thirdly, by comprehending higher-class schools. Otherwise the acts are much alike. Every school is to be open to children of all denominations, and religious instruction is only to be given before or after ordinary school-hours. Provided they conform to the "conscience clause," school-boards may make any provision they please for religious instruction. School-boards are enjoined to relieve the teachers of higher-class schools, so far as may be, from elementary work.]

NATIONAL EDUCATION (*ante*). See COMMON SCHOOLS.

NATIONAL GUARD, an organization for local defense, differing from the British militia and volunteers, in being at the disposal of the municipalities, not of the crown. Italy, Greece, and other nations have maintained this civic force; but the country whence it derives historic fame is France. The French national guard was instituted in Paris in 1789, when the government had an army of 30,000 at the gates. The municipality armed 48,000 men, and their example was followed by the chief towns of France. These corps obtained the name of national guard and assumed the famous tricolor as their ensign. In 1795, 30,000 of the Paris national guards attacked the Tuileries, and were repulsed by Napoleon Bonaparte with 6,000 regular troops. In 1830 they were reorganized under the command of Lafayette, their original chief; and between 1848 and 1851 a law was passed by which all males above 20 not otherwise employed under government were included in the national guard. After the *coup d'état* in December, 1851, they were reduced to the condition of an armed police. In the war of 1870–71 they showed some signs of vitality in sympathy with the commune, but effected nothing for France. After the fall of the commune they were disbanded.

NATIONAL GUARD (*ante*), a body of militia composed principally of the bourgeoisie, first formed by the committee of safety in 1789, and mustering at one time 300,000 men under the command of Lafayette. Napoleon dissolved them in 1795, and reorganized them in 1814. They were again dissolved in 1827, by Charles X., were reorganized in 1830, deserted Louis Philippe in 1848, were reorganized in 1852, and took part in the Franco-Prussian war and the insurrection of the commune.—The same term is applied to the state militia of New York and New Jersey.

NATIONAL HYMNS are popular airs which are peculiar to and characteristic of a particular nation. It is a singular fact that the composers of national hymns are seldom known. The Germans call their national music *volk's musik*, a designation which is very appropriate, as a people collectively may not improperly be considered as the actual composer of its national tunes. A short melody extemporized by some one in a moment of patriotic emotion, is often taken up by others and traditionally preserved. In the course of time it generally undergoes modifications, until it has attained those conditions which insure it a general acceptance This fully explains what W. Grimm means in his laconic saying, "A national song composes itself" (*Ein Volkslied dichtet sich selbst*), for the attempts of celebrated musicians to invest a tune with universal and permanent popularity have been successful in a few instances only. Among the most popular European national hymns, is *God save the King*. but the authorship of the tune has not hitherto been satisfactorily ascertained. In Prussia it is called *Heil Dir im Sieger Kranz*, and in the United States the melody is sung with the words "*My country 'tis of thee*," etc. Although there is no satisfactory evidence of its having been in existence before the reign of George II., there are several tunes known of an earlier date in some degree resembling it. Dr. Bull's tune, discovered in an old manuscript dated 1619, certainly bears a remarkable resemblance to the present *God save the Queen*, but with none of these melodies have the words *God save the King*, or similar words, been found. The Austrian national hymn, *Gott irhatte* [*Franz*] *den Kaiser*, is a composition by Joseph Haydn. Having during his visit to England witnessed the effect of *God save the King*, on public occasions, Haydn resolved after his return to Vienna, to present his country with a similar composition. Baron Swicten and count Saurau procured the poetry for him, and the hymn was sung for the first time on the birthday of the emperor Franz, Feb. 12, 1797. The poetry was written by L. Leopold Haschka. The Russian hymn dates from the year 1830, when the emperor Nicholas ordered it to be performed in concerts and representations on the stage. Its composer was Alexis Lwoff, and the air appears to have been suggested by the *Sicilian Mariner's Hymn*, which is also a favorite melody of the gondoliers in Venice. The poetry of the patriotic song of the Danes, *Kong Christian stod ved höien Mast*, was written by Ewald, and the music is by a German composer, Johann Hartmann. The French national hymn, the *Marseillaise*, dates from the year 1793. It was composed by Rouget de l'Isle during the French revolution. The national hymn of the Germans, *Die Wacht am Rhein*, came into great popularity during the Franco-German war of 1870. *Was ist des Deutschen Vaterland* was written by Ernst Moritz Arndt, a German patriot, during the wars of Napoleon I. There have been many attempts to manufacture national songs in the United States, but the great national hymn of America will probably be a spontaneous production. The *Star-Spangled Banner* was written by F. S. Key, in 1814, and the words were adapted by F. Durang to an old French air, long known in England as *Anacreon in Heaven*, and in America as *Adams and Liberty*. It grew in favor in the loyal states during the rebellion, and was played continually by all military and orchestral bands. But as a patriotic song for the people at large it is almost useless, as the range of the air, an octave and a half, places it out of the compass of ordinary voices. *Yankee Doodle* has the claim of long association, and will probably always retain a certain degree of favor. Its words are mere childish burlesque, and it is reported to have been a popular tune in England during the commonwealth Some state that its doggerel words originated at that time, Oliver Cromwell being designated as Nankee Doodle. Others state that it was the tune originally set to the old English song *Lydia Locket lost her Pocket*, and that the present words were written by a British sergeant in Boston in 1775. *Hail Columbia* was written by Joseph Hopkinson in 1798. and was set to the music of the *President's march*, which was composed by one Phylas or Fayles, a German leader of orchestra in New York. *Columbia the Gem of the Ocean*, and Harrison Millard's *Viva l'America* have also attained considerable popularity.

NATIONAL PARKS, a term applied to certain territory in the United States, set aside by act of congress and specifically exempted from sale, being reserved, by reason of picturesque character and general natural features, as common to the entire people; except for settlement or private use. Up to the present time (1881) two tracts of land have thus been appropriated—the Yosemite valley and the Yellowstone region; the former of which was made a national park by act of congress passed June 30, 1864, and ordered to include the Mariposa Big Tree grove: the Yellowstone park was set aside by act approved Mar. 1, 1872.—The wonders of the Yellowstone region were first made known to the world through the report of a government reconnoisance, or exploration of the Yellowstone river and the surrounding country, made by officers of the U. S. corps of engineers, under the orders of lieut.gen. Sheridan, in 1871. This region, long known as the "Great Divide," is comprised in the territories of Montana and Wyoming, being the geographical center of North America The area covered by the reservation measures 3,578 sq. miles. Generally speaking, it lies between 100° and 110° w. long. and in 44° or 45° n. lat., the general elevation being about 6,000 ft. above the level of the sea, though mountain ranges on every side rise to a height of 10,000 to 12,000 feet. Four routes lead to the Yellowstone national park: 1, From Corinne, on the Central Pacific railroad, to fort Ellis, thence 30 m. to the Yellowstone river; 2, by way of the upper Missouri; 3, from the Canadas and the great lakes to Duluth, and thence by the Northern Pacific railroad; and, 4, from Walla-Walla, on the west. The most convenient and practicable route has hitherto been that from Corinne to Virginia City, Montana; thence to fort Ellis, crossing the Madison river, one of the head-waters of the Missouri; and to the Gallatin valley, which is about 40 m. in length and 10 to 15 broad, the finest agricultural land in Montana; at the upper end of which is Bozeman, and 3 m. beyond, fort Ellis. From this point the trail leads to a Crow agency, about 30 m. distant; and thence by a course nearly due s., following that of the Yellowstone river, to the great falls of the Yellowstone. The whole of this route, after reaching the river, offers some of the most impressive and sublime scenery in the world. Picturesque masses of rock, tall columns of basalt, and a landscape generally volcanic in character, present the most prominent features of the trail; chief among which is the "Devil's Slide," an extraordinary vertical rock formation, projecting a thousand feet into the air. Proceeding up the valley, Gardner's river, or Warm Stream creek, is met, as it enters the valley and joins the Yellowstone 15 m. from the middle cañon. Here begins the hot springs district, with the largest spring in the country, consisting of a basin 40 ft. long by 25 wide, through three openings, in which great quantities of carbonic acid gas are discharged. In this spring, which offers water of different degrees of temperature, in smaller basins and terraces, are found the most fantastic deposits of stalactites and stalagmites; while the basins are gracefully curved and scalloped, and vary in color from a rich yellow to a vivid red, offering a most brilliant and beautiful effect. Leaving this point, the "low divide" is crossed between the valley of Gardner's river and that of the Yellowstone, and the precipitous entrance to the great cañon is reached, so gloomy and forbidding in aspect that it is named the "Devil's Den." Through this narrow gorge the river rushes with great velocity, until it shoots over the abrupt descent of a fall of about 150 ft., and, after a series of rapids and cascades, finally leaves the great cañon with a single leap of 350 ft., after which its course lies over a rolling prairie for several miles. The great cañon has never been explored, but the height of its sides is known to be more than 2,000 feet. A new hot spring region is now reached, remarkable for its "mud geysers," and particularly for a mud volcano, having a crater 25 ft. in width and 30 ft. in depth, and in a constant state of ebullition. One of the geysers having a basin 60 ft. in diameter, spouts at regular intervals of six hours. Eight m. from these geysers is Yellowstone lake, more than 7,000 ft. above the sea-level, 80 m. in length, 15 m. broad, and from 1½ to 50 fathoms deep, with a shore line measuring more than 300 miles. Almost in contact with this remarkable body of water is a chain of hot springs; fish abound in the lake, game of all kinds is found in the surrounding forests, and there are facilities for boating, and rude accommodations for the tourist. Striking westward, the traveler now journeys toward the head-waters of the Madison river. The country, though impressed with volcanic characteristics, is here diversified by dense tracts of forest; and about 10 m. from the Yellowstone a new system of hot springs is reached, the whole district presenting the appearance of a vast limekiln in active combustion. Shortly after reaching the crest of the divide between the Yellowstone and the Madison, a valley is entered in which the springs are strongly impregnated with sulphur. In what is known as the Firehole valley—that of the Firehole river, the main eastern fork of the Madison—are large numbers of beautiful springs. But the object of greatest interest to the tourist is the great geyser basin, which is entered from the north, following the course of the Madison river. The geysers are all named, the first seen being two which are very active, placed one on each side of the river, and known as the "Sentinels." Next is the "Well" geyser, which has a crater formed like a well, and which spouts to a height of 80 or 90 feet. An extraordinary formation, 8 ft. high and 90 in circumference, is called the "Grotto;" it is hollowed into arches, and plays to the height of 60 ft. several times in every 24 hours. The "Giant" geyser is considered one of the most remarkable in the group. It has a crater 5 ft. in diameter, and its highest point is 15 ft. above the mound on which it stands. It throws a column of water the size of the opening, to the measured height of 130 ft. continuing each active period for an hour and a half. From this system of geysers, a journey of about 12 m. reaches "Castle" geyser, which is situated on a platform of deposit, measuring 100 ft. in length and 70 in breadth. From the center of this platform rises a chimney 12 ft. high, 120 ft. in diameter at the base, and 60 ft. at the top, with a three-foot aperture. This monster geyser, when in operation, sends a column of water to a height of 250 ft., the movement being not continuous, but pulsating, at the rate of about 70 throbs to the minute, the time of activity being about an hour. At the head of the valley stands the geyser known as "Old Faithful," so called because it plays with great regularity every three-quarters of an hour, throwing a stream 100 to 150 ft. in height. From the mound of this geyser can be seen the best presentment of the basin. The entire valley is drained of its hot water by the Firehole river, which takes it into the Madison. The geysers visible from this point are severally named the "Bee-hive," the "Giantess," "Grand," "Young Faithful," "Fan," "Riverside," "Saw-mill," "Turban," etc. The Firehole river is itself one of the most remarkable features of this region. Its bed and banks, entirely composed of hot-spring deposit, are honeycombed and scooped out by geyser springs and pools, varying between minute vents not bigger than a quill and great tanks of boiling water. The course of the river is very straight, and resembles that of a canal through a country of limekilns covered with slag-heaps and refuse of old smelting-works. The borders of this stream, and of its confluent, Iron Spring creek, are dotted in all directions with mud ponds, warm pools, boiling springs, and the remains of ancient geysers. The Yellowstone region has been only visited by tourists, and the therapeutic qualities of its springs have not been analyzed. The writer of the government report said of the country in question: "No other locality, I think, can be found which combines so many attractions, both of climate and scenery." The act of congress by which the Yellowstone country was reserved as a national park, stated that it was "reserved and withdrawn from settlement, occupancy, or sale, under the laws of the United States, and dedicated and set apart as a public park or pleasuring ground, for the benefit and enjoyment of the people," while by the same act it was placed under the exclusive control of the secretary of the interior. The park is 65 m. n. and s. by 55 m. e. and west. During the summer months the atmosphere is pure and invigorating, with an entire absence of storms. The number of springs is from 5,000 to 10,000, and there are at least 50 geysers. The temperature of the springs ranges between 160° and 200°.

The Yosemite valley was granted by congress to the state of California, conditionally on the district being forever set aside as a place of public resort and recreation. It is in Mariposa co., California, about 155 m. from San Francisco, nearly in the center of the state. It is nearly level, and is 6 m. long, and varying between one-half a mile and a mile in width; and its perpendicular depth below the surrounding level is about one mile, although it is elevated above the sea level almost 4,000 feet. Its walls are nearly vertical, and through it winds the Merced river, its general direction being n.e. by e., and s.w. by w., nearly at right angles with the general direction of the mountain ranges. The valley is accessible by stage and saddle-horse from points on the Central Pacific railroad, about 90 m. distant, but only in summer: in winter it can only be reached on snow-shoes. There are hotels for the accommodation of tourists, and these are comfortable and well supplied. Numerous objects of interest occur in proceeding up the valley, the first being the Bridal Veil fall, which is formed by the precipitous leap of a creek of the same name over a descent of 630 ft., to a slope below, from which point a series of cascades extend to the valley, the entire fall being more than 900 feet. Cathedral rock, a massive granite formation, 2,660 ft. in height, is met a little above the fall; and a short distance beyond this, the "Spires," single columns of granite, 500 ft. in height, stand out from the main walls of the valley. Sentinel rock is 3,043 ft. high, its termination being a slender obelisk 1000 ft. in height. Sentinel dome and the Virgin's Tears fall are the next important features; the latter being a cataract falling more than 1000 feet. El Capitan and the Three Brothers are monster masses of rock; and, above the latter, is the great Yosemite fall, which has first a vertical descent of 1500 ft., then a series of cascades falling 626 ft., and a final plunge of 400 ft.—the whole appearing to the observer to be a continuous fall, whose effect is grand and imposing in the extreme. During Aug. and Sept. the Yosemite and Bridal Veil falls nearly disappear, the best time for seeing them being in May, June, or July, before the creeks which form them are dried up. Other smaller falls and innumerable eecentricities of the rocky walls of the valley occur at different points; while the general effect is a combination of the sublime and beautiful in nature, not known to exist elsewhere to a similar extent.

About 16 m. s. of the Yosemite valley are the Mariposa groves of "big trees," one of a number of groups or collections of the *sequoia gigantea*, only found in California; and the *sequoia semper virens*, or red wood. Three of these groves are in Mariposa co., and include 134 trees more than 15 ft. in diameter, and 300 of smaller size. In all the groups there are trees from 275 to 375 ft. in height, and 25 to 35 ft. in diameter, well proportioned; the age of some that have been cut down have been estimated, by the usual methods, at from 2,000 to 2,500 years. The Yosemite valley was unknown to white men until 1851, and was first visited by tourists four years later.

NATIVE, a term mostly applied to metals, and employed to designate substances, as minerals, which are most of them more abundantly obtained from other minerals by chemical processes. Thus silver found pure, or nearly so, is called *native silver*, whilst most of the siver in use is procured from ores in which it exists variously combined.

NA'TROLITE, soda mesotype, feather zeolite, *spreustein*, radiolite, Bergmannite, a hydrous silicate of the zeolite section, containing silica, soda, and alumina, with about nine per cent of water, and usually oxide of iron, crystallizes in the trimetric system; crystals usually slender and interlacing, divergent, or stellate; also fibrous and massive. Hardness 5 to 5.5; sp. gravity 2.17 to 2.24. Luster vitreous, sometimes pearly: color white, grayish, and yellowish; transparent, translucent. The following is an analysis of crystals from Auvergne: silica 47.76; alumina 25.88; soda 16.21; water 9.31. The following were the constituents of iron natrolite: silica 46.54: alumina 18.94; peroxide of iron 7.49; soda 14.04; water 9.37; iron 2.40; manganese 0.55. In North America natrolite occurs in Nova Scotia in trap rock; at Cheshire, Conn; at Copper falls, lake Superior, in crystals associated with native copper. Natrolite is also found at Bergen hill, N. J.

NA'TRON, or TRONA, an impure sesquicarbonate of soda $(2NaO.HO,3CO_2 + 3Aq)$, which always contains sulphate of soda and chloride of sodium. It is obtained from the margins of lakes in Egypt, Siberia, Thibet, etc., and from the borders of the Black and Caspian seas.

NATRON LAKES, Natron was one of the substances employed by the ancient Egyptians in embalming mummies. They called it *hesmen*, and, together with the lakes from whence it was derived, it is mentioned in texts of the twelfth dynasty, *circa* 1800 B.C. These lakes, eight in number, are in the vicinity of Zakeek, a village west of the Damietta branch of the Nile. They are below the level of the sea, and the natron is obtained by evaporation. The locality is also renowned for four monasteries, Deyr Suriana, St. Maiarius, Amba Bishoi, Deyr Baramoos, from whose libraries of Arabic, Coptic, and Syriac MSS. the national collections have been enriched. In the time of St. Pachomius 5,000 anchorets dwelt here; they at present number about 300.

Lepsius, *Todt. Taf.* vii. c. 17, l. 17; Wilkinson, *Mod. Egypt*, i. 382; Brugsch, *Wanderung nach Natron Klöstern* (12mo. Berl. 1855).

NATTERJACK. See TOAD.

NATU'NA ISLANDS, THE, lie to the n.w. of Borneo, between 2° 28′ and 4° 56′ n. lat., and 107° 57′ and 108° 15′ e. longitude. They are densely wooded and mountainous, Ranay, on great Natuna, rising to a height of 3,500 feet. The largest of the islands is about 600 sq. miles. Pop. of the whole about 1800, who grow rice, maize, sago, cocoanuts, etc., and exchange the produce of their fishings, their sago and cocoa-nut oil, for rice, iron, and cottons, at the European settlements on the strait of Malacca.

NATURAL, in music, a note belonging to the diatonic scale of C, and neither elevated by a sharp nor depressed by a flat. When a note has been so elevated or depressed, the natural sign ♮ prefixed to it on its recurrence restores it to its place on the scale. When music is written on a key with a signature of sharps or flats, it is the office of the natural sign to counteract the signature as regards the note to which it is prefixed.

NATURAL BRIDGE, one of the chief natural curiosities in the United States, ranking in interest next, perhaps, to Niagara falls and the Mammoth cave. It is situated in Rockbridge co., Va., 115 m. w. of Richmond, and 160 m. s.w. of Washington. The bridge spans a deep chasm, through which a small stream flows, and is formed by an immense limestone stratum fashioned into an arch 215 ft. high. Its length is 93 ft. and the thickness of the crown of the arch is about 40 feet. The average width of the arch is 80 feet. A public road passes across it from which there is a beautiful view, not only of the long chasm where great forest trees tower up from below but also of the Blue Ridge mountains.—In Walker co., Alabama, and in California also there are other natural bridges, but none that rival this one. The one in Alabama is about 70 ft. high and spans 120 ft.; and the largest of those in California is across a small creek emptying into the Hay fork of Trinity river; is 3,000 ft. wide and has an arch 20 ft. high by 80 ft. across. It has been suggested that these bridges are the remnants of great caverns.

NATURAL HISTORY, in the widest sense, includes all natural science, and has the whole of creation for its subject. In this sense the term was employed by the philosophers of antiquity. But it is now limited to those branches of science which relate to the crust of the earth and its productions. Of these, geology and mineralogy have for their subject inorganic portions of creation; botany and zoology, the various branches of which are often pursued as separate sciences, with physiology, have for their subject organized creatures. Natural history takes cognizance of the productions of nature, and of their relations to each other, with all the changes on the face of the earth, and all the phenomena of life, both animal and vegetable. It derives assistance from other sciences, particularly chemistry and natural philosophy; and some of the branches of chemistry may also be regarded as branches of natural history. When man himself is considered as a subject of scientific study, psychology must be added to the branches of natural history, but in the term as commonly employed this can scarcely be said to be included.

In every department of natural history, classification is of the utmost importance, and scarcely less important is a scientific nomenclature suited to the classification. The subjects of study are so incalculably numerous that an arrangement of them in well-defined groups is necessary to any considerable attainment in the knowledge of them; and it is only by systems of classification which arrange smaller groups in larger, and these in larger and larger again, that natural history has been brought to its present state. The very division of natural history into different sciences is a result of such a classification, and implies a recognition of the largest and highest groups. It is not always in the establishment of these groups that the greatest difficulty is experienced. The primary distinction of all the subjects of natural history into organized and unorganized, or into those having life and those not having life, presents itself very readily to every mind. And equally natural and necessary is the distinction of organized beings into plants and animals, however difficult it has been found to draw the precise limit between the lowest of plants and the lowest of animals. Another distinction readily presents itself to the student of living beings in the kinds which retain the same characters from one generation to another. But here arises one of the most important of all the questions of natural history, what a *species* is, and how it differs from a *variety*. For this we refer to the article SPECIES. But much difference of opinion as there is on this point, the common and long-prevalent notion may be assumed, as suitable enough for guidance in all that relates to classification, that those are distinct *species* which cannot by any change of circumstances—or, let it be said, by any *ordinary* change of circumstances, and within any *moderate* period of time—be so modified as to be transmuted one into another, whilst those are only *varieties* of which the modification and transmutation can be thus effected. Thus, in botany, *Brassica oleracea* is a species, of which kale, cabbage, cauliflower, broccoli, Brussels sprouts, etc., are varieties. Species, grouped together, according to their natural affinities, form *genera;* but a *genus* does not necessarily consist of more species than one; for, whilst some contain hundreds of species, others, apparently very distinct, contain only one as yet known to naturalists. The distinctions by which genera are separated are of course arbitrary, and are admitted to be so by those who deny that the distinctions between species are arbitrary, or that there is any uncertainty about them but what arises from the imperfection of our knowledge; for, at present, it must be admitted on all hands, that the uncertainty is in innumerable instances very great, what are species and what are varietier. The great object, however, in the formation of *genera* is that they shall be accordant with the facts of nature; and so in regard to the larger or higher groups which are composed of associated genera, as tribes, families, orders, classes, etc. But in all this, the great difficulty is that affinities exist on many sides; and that groups cannot be satisfactorily arranged in the order of a series, but often rather as if they radiated from a common center; whilst otherwise viewed, the same groups might seem to radiate very differently from another common center. A *natural system* is one framed with the utmost possible regard to all these facts; an *artificial system* fixes on one class of facts and proceeds upon it, in disregard of all others. See BOTANY. In the inorganic departments of nature a *species* is of course something different from what it is in the organic. But classification still proceeds on the recognition of facts in nature itself, which it is sought to exhibit in the groups that are formed. See MINERALOGY.

The nomenclature of natural history, in so far as it relates to organic beings, continues essentially as it was established by Linnæus. See GENUS. The names have in many cases been changed, but not the mode of nomenclature.

NATURALISM is the name given in philosophy to those systems which profess to account for the phenomena of nature, by what they call the necessary action of unintelligent and inherent forces. Such, for example, was the doctrine of Lucretius, Leucippus, and Epicurus. It leads also to various forms of theological speculation and belief which deny the agency of a personal God in the production, preservation, and government of the physical, intellectual, and moral universe. In this aspect, therefore, naturalirsm is opposed to theism.

NATURALIZA'TION, the act of placing an alien in the position, or investing him with the rights, of a natural-born citizen. The present arrangements with reference to naturalization, by which the old rule that British allegiance is indelible, has been changed, are embodied in the naturalization act (1870), 33 Vict. c. 14, and the naturalization oath act (1870), 3 and 34 Vict. c. 102. By the former of these statutes it is provided that an alien who has resided in the United Kingdom for a term of not less five years, or has been in the service of the crown for a term of not less than five years, and intends, when naturalized, either to reside in the United Kingdom or to serve under the crown, may apply to one of her majesty's principal secretaries of state for a certificate of naturalization. The applicant is bound to adduce such evidence of his residence, or service, and intention to reside, or serve, as shall satisfy the secretary of state, who may, with or without reason assigned, give or withhold a certificate. No appeal lies from his decision, but his certificate takes no effect until the applicant has taken the oath of allegiance. An alien, to whom a certificate of naturalization has been granted, is entitled to all political and other rights, powers, and privileges; and subject to all obligations to which a natural-born subject is entitled or subject in the United Kingdom, with this qualification, that he, when within the limits of the foreign state of which he was previously a subject, is not deemed a British subject, unless he has ceased to be a subject of the foreign state by the laws thereof, or by a treaty to that effect. Such a certificate may be granted to any person with respect to whose British nationality a doubt exists; and a grant of such special certificate for the purpose of quieting doubts shall not be deemed an admission that the person to whom it was granted was not previously a British subject. Aliens previously naturalized may, on application, obtain certificates. A British subject who has become an alien, in pursuance of this act (see ALIEN), may apply for a certificate of readmission to British nationality on the same conditions as an alien by birth. The secretary of state has, in this case, the same discretion; and an oath of allegiance is likewise required. The privilege of readmission, like that of admission to British nationality, requires that the recipient shall have ceased to be a subject of the foreign state. In the colonies the powers of the secretary of state are conferred on the governor. By the oaths' naturalization act, 33 and 34 Vict. c. 132, any person making or subscribing a false declaration is declared to be guilty of a misdemeanor.

In France, "la grande naturalization" confers political privileges; "la pétite naturalization," gives all the private rights of a French citizen, and it has been doubted whether even public rights are not included in it. In 1867 the term of residence was reduced from ten years to three. A subject of France loses his native character by naturalization in a foreign country, or acceptance of office abroad without permission of the state, or even by establishing himself permanently out of his country. He may recover his rights by renunciation of his foreign office or domicile.

In Prussia the higher administrative authorities can naturalize any stranger who satisfies them as to his conduct and means of subsistence. Nomination to a public office confers naturalization. Prussian nationality is lost—(*a*) by discharge upon the subject's request; (*b*) by sentence of the competent authority; (*c*) by living ten years in a foreign country; (*d*) by marriage of a female subject with a foreigner.

In Austria the authorities may confer the rights of citizenship on a person, after ten years' residence within the empire, who has been allowed to exercise a profession. A public functionary becomes thereby invested with rights of citizenship; but admission into the army has not this effect.—In the kingdom of the Netherlands, the power of naturalizing rests in the crown.—In Russia naturalization is effected by taking an oath of allegiance to the emperor.

In the American states five years' residence, and a declaration of intention to become a citizen, emitted before a magistrate, is requisite to naturalization. See *Report of Royal Commissioners on Naturalization* (1869).

NATURALIZATION (*ante*). The right of a citizen to throw off his natural allegiance to the state of his birth and take a similar obligation to a foreign sovereignty has long been contested, and by many nations is not yet fully admitted. In the colonial history of this country the English system of restricting the rights of citizenship seriously conflicted with the obvious policy of a new country to strengthen itself by immigration; and the declaration of independence charges George III. with endeavoring "to prevent the population of these states; obstructing the laws for the naturalization of foreigners; and refusing to pass others to encourage their migration hither." Under the old confederation the exercise of the power of naturalization was vested in the separate states. As the articles provided that the citizens of each state should be entitled to all the privileges and immunities of the citizens of all the several states, much confusion of rights and disagreement as to the legal status of foreigners arose. In the new constitution, therefore, it was provided that "congress shall have power to establish a uniform rule of naturalization" (art. I., sec. 8). In pursuance of this authority congress has passed many acts at various dates from 1802 onward, and treaties have been made with several foreign nations on the subject. The naturalization may be collective, as in the acquisition of new territory by purchase or conquest; or personal, where citizenship is conferred upon an individual upon his complying with the provisions of the law. When once naturalized the applicant possesses all the immunities and privileges of native citizens, with these exceptions: he is not eligible to election as president or vice-president of the United States, and cannot serve as senator until he has been a citizen for nine years, or in the house of representatives until he has been a citizen seven years. (Constitution, art. II., sec. 1; art. I., sec. 2, 3.) In every other particular the naturalized stands on the same footing with the native citizen, and is entitled to the protection of the government abroad as well as at home. Decisions of the U. S. supreme court (1817) definitely settle the rule that the states had no jurisdiction on the subject of naturalization. But they may pass laws admitting foreigners to any privileges which fall short of citizenship; they may confer the right of acquiring and transferring property, or may even make them voters. The policy of the government of this country has always been very liberal in regard to the conditions of acquiring citizenship, as a general increase of population has up to this time been considered most desirable; and though there was weighty authority for the doctrine that an American citizen could not renounce his allegiance without consent of the government and by process of law, yet the state department has always acted on the adverse theory. Without examining in detail the many acts which have been passed to regulate the process of naturalization, the present provisions of the law may be briefly classified as follows: Those persons who have resided in the United States prior to June 18, 1812, may be admitted without any declaration of intention. Any alien, twenty-one years old or more, who has served in the military forces of the United States, may be admitted without preliminary declaration, on proof of one year's residence, of good moral character, and of an honorable discharge from the service. Foreign seamen may obtain full *protection* as American citizens by filing a declaration of intention in a competent court; but to become citizens, in fact, they must afterwards serve three years on a merchant-vessel of the United States, and present at the end of that time a certificate of good conduct and a discharge. In case of an alien minor who has resided in the United States three years immediately preceding his twenty-first birthday and has five years of continuous residence before making application, including the three, declaration of intention is not required; but he must take oath at the time of application that for at least two years he has had the *bona fide* intention of becoming a citizen, and in all other ways must comply with the general rule. The language of the act regulating the naturalization of minors is rather obscure, and it was formerly maintained by many that of his five years' residence, two must be passed after his coming of age, but it is now settled that if the residence extends from his fifteenth to twenty-first year it will suffice. The children of foreign parents who are naturalized become so also, if minors and living in this country at the time, and it has been held that the naturalization of the father only suffices. Any person not coming under the classes already mentioned must, at least two years before admission, make oath before a district or circuit court of the United States, or before any court of law having common law jurisdiction and possessing a seal and clerk, that it is his *bona fide* intention to become a citizen and to renounce forever all allegiance to any foreign prince, potentate, state, or sovereignty; and, by name, that particular prince, state, or sovereignty, of which he is at that time a subject or citizen. A certificate of the fact that such a declaration has been made is made out by the clerk, signed and sealed and given to the applicant as evidence of the declaration of intention. Five years' residence in the country, and one year in the state where the application is made, are necessary; by residence is meant permanent abode, but it is not affected by temporary absence on business or pleasure. The court must also be satisfied that the person applying is of good character and well disposed to the public welfare and the principles of the constitution. If the alien have hitherto possessed any hereditary title or order of nobility, he must forever renounce it. As to evidence, that of residence must rest on other proof than the applicant's oath, but a single witness is taken on this point, and on others the alien's oath is generally deemed sufficient. The depositions, certificate of declaration of intention, and the final order of admission, compose the record of the case and are put on file. A certificate of naturalization is made out, sealed, and signed by the court clerk and is given to the alien as evidence of his citizenship. The record is conclusive and cannot be contradicted or overthrown, except by proof of perjury or other fraud in its procural. Severe punishment by fine and imprisonment is provided for the taking of any false oath or affirmation in connection with the proceedings; for any false personation either by applicant or witness; for counterfeiting or imitating any instrument, paper, or proceeding used in the case or authorized by the naturalization laws; for selling or disposing any such oath, certificate or notice, as genuine, or for falsely representing one's self as a citizen of the United States without having been duly admitted to citizenship. Aliens who are subject to a country at war with the United States at the time of application cannot be naturalized while the war continues. In the early days it was several times held that the wife of a naturalized alien had not herself acquired the status of a citizen, if originally alien; but it was long since decided by the supreme court that the citizenship of the wife should follow the naturalization of the husband, and that it makes no difference whether the marriage is contracted before or after the citizenship of the husband is secured. The right of expatriation, as it is called, that is of freedom to throw off the natural allegiance and acquire a new allegiance to another government, is now generally recognized by the nations of Europe and America, though not as a matter of inherent right but rather of permission from the authorities, and as a matter of public policy to prevent disagreeable international complication. The English act of 1870 provides both for the naturalization of aliens, after five years' residence and application to the secretary of state, and also that any British subject who shall voluntarily become naturalized in any foreign country shall from that time on be regarded as an alien and no longer a British subject. A treaty was entered into in the same year between Great Britain and our country, providing that aliens who have complied with the conditions of admission and have been fully naturalized should be recognized as such by the country of their birth; but the original allegiance may be recovered by much the same process. Treaties were also made by the United States, in 1868, with Prussia, Bavaria, the grand duchy of Baden, Würtemburg, grand duchy of Hesse, Belgium, and Mexico; in 1869 with Sweden and Norway; in 1870 with the Austro Hungarian empire, and in 1872 with Ecuador and Denmark. These treaties have the same general stipulations, stating a period of residence, usually five years, after which naturalization is permissible and to be recognized, reserving to the country of the original allegiance the right to punish for crime committed, or to compel the execution of obligations entered into, before the change of domicile, and entering into mutual obligations to recognize the rights of each other. The question on which there is the greatest likelihood of disagreement under existing laws, arises where an alien comes to this country, becomes duly naturalized and then returns. Is he then liable to undergo military service or otherwise recognize the allegiance of the state of his birth? Some European nations hold that such a transaction is on its face evidence of an intention to escape the natural obligations, but the policy of our government has always been to protect its adopted citizens where the naturalization is not tainted by fraud.

NATURAL'IZED. In the language of botanists and zoologists, those plants and animals are said to be *naturalized* in any country, which, having been introduced into it by man, have established themselves so as to exist without his care. A plant or animal is never said to be naturalized so long as it exists merely in a state of cultivation or domestication, but is so when it becomes truly wild, and, unaided, competes successfully for a place among those which are indigenous to the country. Thus, the horse is not naturalized in Britain, or in most of the countries in which it is most highly valued; but both the horse and the ox may be said to be naturalized in South America. Many of the plants now most characteristic of southern Europe are sometimes said to have been originally introduced from the east; and some that are abundant in many parts of Britain were, in all probability, brought from the continent of Europe. Some of these almost evince their foreign origin by growing chiefly near ruins, or in places which have long been the seats of human habitation. Many plants now naturalized in Britain appear to have been originally brought for medicinal use, although now disregarded. In many cases, however, naturalization has taken place without any attempt having ever been made by man to introduce the plant, even for cultivation; and thus many European weeds are now common in America, the seeds having found their way thither with those of more valuable plants, or in some such accidental manner. The same thing has taken place as to animals. Thus mice and rats find their way from one country to another; thus the bed-bug found its way at no remote date to Britain; other insects have been even more recently introduced with foreign productions of different kinds; and a mollusk (see DREISSENA), previously unknown, has established itself in some British rivers and canals. The pheasant may be mentioned as an instance of naturalization in Britain designed and successfully accomplished by man. An *acclimatization society* has recently been formed in London, which has for its object the naturalizing, rather than what may more strictly be called the acclimatizing, of animals deemed suitable and desirable. It is unquestionable that much may be done by naturalization of animals, not only to render rural scenes more attractive, but also to increase their economical productiveness. Perhaps nothing of this kind has received so little of the attention due to its importance as the naturalization of fishes. See PISCICULTURE.

NATURAL OBLIGATION, in law, means an obligation which is supposed to be prescribed by the law of nature, as the obligation of a parent to maintain his child. In England such an obligation is not recognized by the common law, and therefore it was necessary in the poor-law statutes to punish by a penalty parents who, being able, refused or declined to maintain their children. In Scotland the natural obligation of a parent to maintain his child is, however, recognized by the common law, though it is also enforced by the poor-law statute.

NATURAL PHILOSOPHY is a term frequently employed in Great Britain to designate that branch of physical science which has for its subject those properties and phenomena of bodies which are unaccompanied by any essential change in the bodies themselves. It thus includes the various sciences which are classed under *physics* (q.v.) in the limited sense of that term.

NATURAL THEOLOGY is the name given to that branch of moral science which concerns itself with the evidences for the existence of God, drawn from an inquiry into the constitution of the universe. It is believed by the majority of philosophical thinkers that these evidences warrant the belief in a Being of infinite power, wisdom, benevolence, and justice. There are, however, philosophers of great eminence who deny that there is such a thing as natural theology, who say that nature, at the best, gives forth an uncertain sound regarding the existence of a Supreme Being, and that a logical demonstration of such existence is impossible, and has always broken down. This view is held, for example, by atheists like David Hume, and the recent Scoto-Oxonian school of metaphysicians, of whom the principal representative is dean Mansel. The standard English work on the subject has long been Paley's *Natural Theology* (Lond. 1802; new edition by lord Brougham and sir Charles Bell, 1836). The Bridgewater and Burnett Treatises are also contributions to this branch of science.

NATURAL THEOLOGY (*ante*), the name applied to the knowledge concerning the existence and attributes of God, furnished by the organized universe. This knowledge springs from the answers to two questions: 1. Is this complicated universe the work of a personal creator, or a result of impersonal force? 2. If of a personal creator, what does it, as his work, show concerning his character, attributes, and relations to his creatures? The answers to these questions depend on the assumptions that every change must be effected by some adequate cause, and that design proves the existence of a designer, whose attributes and character are indicated in his work. The basis for these assumptions is found, by the best thinkers, in the intuitive beliefs of the human mind. While any instance and degree of design prove the existence of a designer, the sum total of all instances and all degrees must be taken, in order to a full knowledge of the designers; and if, in all the instances, unity of design be manifested, then the existence of one designer, adequate to all the work, is proved. The investigation, therefore, requires the examination of all orders of objects and creatures, of all degrees of complexity and completeness in the properties, qualities, constitutions, and relations, physical, mental, and moral, which they display. The examination may be practicable only in part, and only as to results; but in proportion as it can be completely made and can be extended also to the means and processes by which the design has been carried into effect, the proof of high qualities in the designer will be increased. The proof of design in Paley's often cited instance of a watch, picked up in crossing a heath, cannot be set aside by raising questions concerning the length of time employed, or the instruments used in its construction; and while the slightest inspection of it may furnish proof of design, the proof will be strengthened and the display of design increased by a thorough and skillful examination of its complicated mechanism. If machinery that will make many watches be examined, the degree of design will be proportionally greater; and if a watch could be made to throw off other watches as a part of its work, instead of the proof of design being abrogated, it would be marvelously increased. Some persons, indeed, claiming to be philosophers, seek to limit all investigation to the phenomena of nature, denying or disregarding efficient and final causes as either not existing or not proved. They say, "Our reflecting reason is the sole cause of all the apparent design which exists and which is nothing but the combination of natural materials and forces."

But, to this assertion it is sufficient to reply that it fails to account (1) for the existence of the natural materials and forces; (2) for the combination of them in the production of one result; (3) for the existence of the reason of man, which is capable of reflection, and (4) that it does not show how reason can be the cause of a design—or of anything else—which is only apparent, not real. The history of mankind shows that there has at all times existed, in the mind, some idea of God, or of gods, or of some supernatural beings, to be sought, worshiped, or feared. Some, indeed, have asserted that the most degraded tribes have no such idea, and that the deaf and dumb also are destitute of it until they are instructed. But to this it is answered that while, in the lowest degradation, the *light* of the idea may be nearly or quite extinguished, enough of dark superstition remains to show that the light once shone; as, in an extinguished or dimly burning lamp, the very blackness of the wick proves the previous existence of a brighter flame. And, as to the deaf and dumb, granting the facts alleged, it cannot be certainly maintained that they have no idea of God, because they, in their want of education, cannot express it in language; or we, in our imperfect intercourse with them, cannot draw it forth from their minds. Some have regarded the idea of God as innate in the human mind, from the fact that the belief in his existence has been so general in all ages of the world. But this theory is now held, if at all, only in the modified form that in the development of the mind the idea of God is certainly reached through the study of nature and of man.

NATURE-PRINTING. This is a process by which engravings or plates answering thereto are produced by taking impressions of the objects themselves, and printing from them. There is some dispute as to the original inventor of this art; Denmark claims it for a native of Copenhagen, Peter Kyle, a goldsmith, who died about 1833, leaving the MS. description of his invention in the archives of the royal collection of engravings in that capital. It is, however, admitted that no use was made of his invention. In 1853, Alois Auer, director of the state printing establishment of the Austrian empire, published his process, and also some very beautiful works illustrated by this art. About the same time, in England, Mr. G. W. Aitkin made known his discovery of an exactly similar process, and showed some very beautiful plates of feathers, ferns, etc. But whatever other claims may be advanced, it is certain that Alois Auer holds undisputed right to the title of original inventor and practical applier of the invention. The process is very simple, as practiced by Auer; but it cannot be applied to any objects except those with tolerably flat surfaces, such as dried and pressed plants, embroidery and lace, and a very few animal productions. The object is placed between a plate of copper and another of lead, both worked smooth, and polished; they are drawn through a pair of rollers, under considerable pressure—M. Auer says 40 to 50 tons; then, when the plates are separated, it is found that a most beautiful and perfect impression of the object has been made in the leaden plate. This may be used directly as an engraved plate, if only a very few impressions are wanted; but as it is too soft to resist the action of the press for practical purposes, a fac-simile of it is obtained in copper by the electrotype process, which is used as the printing-plate. The best practical use to which nature-printing has yet been applied is the multiplication of patterns of lace and other figured surfaces, either in textile materials or metals, for trade purposes. Lace-prints especially are so exactly like the originals that the most fastidious can require nothing more; hence the cutting up of valuable pieces of lace for patterns has been saved. Henry Bradbury, of the then existing firm of Bradbury & Evans, London, made nature-printing his special study, and produced the exquisite works, *Nature-printed Ferns*, and *Nature-printed Sea-Weeds*, in 2 vols. each (London: Bradbury & Evans).

NAUHEIM, a t. in the duchy of Hesse-Darmstadt, Germany, n. of Frankfort; pop. 2,500. Its mineral springs attract many visitors annually. The waters, both as an external and internal application, are highly valued as a remedy for diseases of the bowels and cutaneous affections. Mineral springs abound in the vicinity also, and their waters, with those of Nauheim, are extensively exported for use in other parts of Germany. Salt-works had long existed at Nauheim, but the baths were not opened till 1834. A fountain, opened by a shock of earthquake in 1846, produces some 75,000 quintals of salt per year, besides furnishing a supply of water for the bath-houses. Gambling, which was formerly extensively practiced, has been abolished.

NAUMA'CHIA, a Greek word, signifying literally a naval battle, afterwards, among the Romans, a spectacle which consisted in the imitation of a naval battle. Julius Cæsar was the first to introduce a naumachia into Rome, 46 B.C., causing a portion of the Campus Martius to be dug to form a lake, on which the "spectacle" came off. Augustus made an artificial lake (*stagnum*) near the Tiber for the same purpose, which was afterwards frequently used for naumachiæ. Claudius also exhibited a splendid one on lake Fucinus. Nero, Domitian, and others were likewise fond of such amusements. The combatants were termed *naumacharii;* they were for the most part either captives or condemned criminals; and the rival fleets took their names from the famous maritime nations of antiquity: Tyrians and Egyptians, Rhodians and Sicilians, Persians and Athenians, Corcyræans and Corinthians, Athenians and Syracusans. The magnificence of these spectacles may be estimated from the fact that in the one exhibited on lake Fucinus 19,000 men were engaged. These *naumachiæ* were not *sham-fights*, any more than ordinary gladiatorial combats. Both sides fought on in real earnest for dear life until one was utterly overpowered; and, as a rule, multitudes were "butchered to make a Roman holiday."

NAUMANN, Emil, b. Berlin, 1828; son of Moritz Ernst Adolf. He studied music under Mendelssohn, and in 1848 brought out his first composition of importance, an oratorio called *Christ, the Messenger of Peace*. In 1852 he published a study of German church music, under the title of *The Transformation of Protestant Church Music*. About the same time he became director of church music at Berlin. He has since written, besides many compositions in sacred music, a number of operas, of which *The Witch of the Mill* and *Judith* deserve mention, and a cantata on the *Destruction of Jerusalem*. His work on the *Introduction of Psalmody into the Evangelical Church* appeared in 1856, and his *Music in the History of Civilization* in 1870.

NAUMANN, Karl Friedrich, 1797-1874; b. Germany; educated at the Freiberg school of mines, and at the universities of Jena and Leipsic. In 1821 he made a journey to Norway for scientific purposes, and the results of his observations were published in his *Contributions to the Knowledge of Norway*, 2 vols., 1824. Two years later he became professor of crystallography at Freiberg, and in 1835 he was transferred to the chair of geognosy in the same institution. In 1842 he was called to the chair of geognosy and mineralogy at Leipsic. The most important of his works on mineralogy and geognosy are: *Elements of Crystallography*, 1841; *Elements of Mineralogy*, which ran through many editions; and *Manual of Geognosy*. He became privy councilor of mines in 1866.

NAUM'BURG, a t. of Prussian Saxony, in the government of Merseburg, situated 17 m. s.s.w. of the town of that name, on the Saale, in the midst of a striking amphitheater of vine-clad hills. Besides its cathedral—a noble Gothic structure, completed in 1249, with two choirs, and containing many beautiful sculptures—there are several other churches. The manufactures are cotton and woolen fabrics, leather, and chemical products. Wine is grown in the vicinity in considerable quantity—11,000 gallons yearly. During the thirty years' war, and in the campaigns of 1806 and 1813, Naumburg, in which the Prussian magazines were lodged, was a place of great importance. Five annual fairs are held here. Pop. '75, 16,827.

NAUPACTUS. See Lepanto, *ante*.

NAUP'LIA, a small fortified t. and seaport in the Morea, Greece, at the northern extremity of the gulf of Argos or Nauplia, and 7 m. s.e. of the town of Argos. It is laid out in the manner of a European town. Its roadstead is one of the best in Greece. In the church of St. Spiridion, Capo d'Istria was assassinated in 1831. Nauplia is of high antiquity. At an early period it was the port and arsenal of Argos. In the 13th c. it was occupied by the Venetians, and was taken by the Turks in 1540. From 1834 to 1835 it was the capital of Greece, and had a population of upwards of 12,000; but on the removal of the court to Athens it fell into decay. Pop. about 4,000.

NAU'SEA is a distressing sensation always referred to the stomach. It is unattended by pain, but is usually accompanied by a feeling of general languor or debility, a small and often irregular pulse, a pale, cool, and moist skin, general muscular relaxation, an increased flow of saliva, and a sensation that vomiting will supervene. It is most commonly a *direct* symptom of disease or disorder of the stomach, but sometimes it is a very important *indirect* symptom of disease of some part at a distance from the stomach—as, for example, the brain or the kidney. The nausea which is so troublesome to pregnant women is due to the irritation excited by the enlarged uterus being reflected by nervous agency to the stomach.

NAUSETS. See Massachusetts Indians.

NAUSHON. See Elizabeth Islands.

NAU'TÆ, CAUPO'NES, ETC. These words are the commencement of an edict in Roman law, which made shipmasters, innkeepers, and stablers liable for the safety of the goods brought into the ship, inn, or stable. The same doctrine is adopted by the common law of England and Scotland, subject to variations produced by the carriers' act, and railway and canal traffic act, so far as regards carriers and railway and canal companies.

NAU'TICAL ALMANAC, a work projected for the special behoof of astronomers and navigators. See Almanac. It is chiefly valuable to the latter class from its containing tables of the "lunar distances,"—i.e., distances of the moon from a few (5 to 7) of the more prominent stars, given for every three hours throughout the year—by which at the present day longitudes (see Latitude and Longitude) are most conveniently and accurately determined. To the astronomer the *Nautical Almanac* furnishes a great mass of important data; it gives the position of the moon in right ascension and declination for every hour, and the sun's latitude and longitude for every day in the year; it shows the obliquity of the ecliptic, the sun's and moon's parallax, aberration, etc., at different times; it supplies the necessary data for the determination of the real or apparent size, position, and motion of the planets and their satellites; it fixes accurately the places of about 150 fixed stars, and gives full details concerning eclipses, occultations, transits, and other celestial phenomena occurring during the year. It is generally issued four years in advance for the sake of mariners going on long voyages.

NAUTICAL SURVEYING. See HYDROGRAPHY, *ante.*

NAUTILUS, a genus of *tetrabranchiate cephalapoda* (q.v.), extremely interesting as the existing representatives of an order of mollusks now reduced to a very few species, but of which the fossil remains attest the great abundance in former geological periods. The species of this genus are found only in the seas of warm climates. One or more of them must have been known to Aristotle, as appears from his description, which, however, is not minute. Yet it is but recently that they came under the observation of modern naturalists; and they were very imperfectly known, till a specimen, obtained by Dr. Bennett in a bay of the New Hebrides in 1829, was submitted to the examination of prof. Owen, and became the subject of a valuable memoir by him. The shell, indeed, has long been common enough in collections, being plentifully found, entire or in fragments, on many tropical shores; but from the shell alone little could be learned concerning the animal to which it belonged. The shell is spiral, the spire not at all elevated; and thus, in external form, resembles the shells of many species of snail; but internally it is *camerated*, or divided into chambers, by transverse curved partitions of shelly matter. In a very young state this structure does not exist; but as the animal increases in size it deserts its first habitation, which then becomes an empty chamber, and so proceeds from one to another still larger, occupying the outermost only, but retaining a connection with all by means of a membranous tube (*siphuncle*) which passes through the center of each partition. The use of this connection is not known; but the most probable supposition is that the animal is enabled, by throwing air or some kind of gas into the empty chambers of the shell, or by exhausting them of air, to change the total weight, so that it may rise or sink in the water at pleasure. It commonly inhabits the bottom of the sea, where it creeps about, probably like the gasteropods, by means of a large muscular disk with which the head is furnished; but it sometimes rises to the surface, and is to be seen floating there. Dr. Bennett states that the specimen which he fortunately captured attracted his attention, when thus floating, as an object resembling a dead tortoise-shell cat. The story of its spreading a sail is as fabulous as the similar story regarding the argonaut. The head and arms can be protruded from the shell, and can also be completely retracted within it. There are numerous arms attached to the head, 19 in the best-known species; there are also numerous other tentacles; but none of these organs are furnished with suckers, and they are feeble in comparison with the corresponding organs of many of the higher or dibranchiate cephalopods. The mouth is of the parrot's-bill form, as in the other cephalopods; but the mandibles are not entirely composed of horny matter, their extremities being calcareous and of a hardness apparently adapted for breaking shells. Their edges are also notched, and show an adaptation for crushing rather than for cutting. The tongue is large. The gizzard is muscular. The food appears to consist, at least in great part, of crustaceans.

Only three species of nautilus are known, of which the best known and apparently the most abundant is the PEARLY NAUTILUS (*N. pompilius*), which is found in the Indian and the Pacific oceans. Its shell is beautifully nacreous within; and is externally porcelain-like, white, and streaked with reddish chestnut. The shell, being large, thick, and strong, is used for a variety of purposes by the natives of the East Indies and South Sea islands; it is also made into ornaments of various kinds in China and elsewhere. The animal is eaten by the Fijians and other South Sea islanders, and is much esteemed as an article of food. The Fijians capture it by means of a basket-trap, somewhat like those used for catching lobsters, baited with boiled crayfish. The name PAPER NAUTILUS has sometimes been given to the argonaut (q.v.).

Fossil Nautilus.—About 150 species of fossil shells have been referred to this genus. They occur in all the strata from the upper silurian to the most recent deposits. Numerous forms, however, which exhibit very wide differences, have been incongruously associated under this generic name. The paleozoic nautili are so remarkable that they must certainly be referred to one or more separate genera; some of the carboniferous species have a square back, and the whorls either compact or open in the center, while the last chamber is more or less disunited from the shell; and the Devonian clymenia has angular sutures and an internal siphuncle. Until a careful revision of this section of the cephalopoda is made it will be better to consider the species as belonging to the family *nautilidæ*, and not to the genus *nautilus*.

NAUTILUS PROPELLER was long the best known among many names given to a mode of propelling steam-vessels by means of a horizontal wheel within board, instead of a paddle or a screw on the outside. *Hydraulic* propeller has latterly come more into use. Engineers thought of this mode of propulsion generations ago, and patents have been taken out for inventions relating to it by Toogood, Hayes, Rumsey, Linaker, Hall, and others; but the most successful attempts to realize it have been those of Mr. Ruthven. He constructed a small boat, 9 ft. long, in 1839 (tried on the Union canal), and a vessel, 40 ft. long, in 1844 (tried on the Forth), to test the principle; each was worked by a small steam-engine, and provided with the hydraulic apparatus. In 1849 Mr. Ruthven made improvements in the apparatus, and introduced them in a vessel, 30 ft. long, tried upon the Thames. In 1851 he placed a boat in the great exhibition. In 1853 a vessel on this principle, called the *Albert*, was built in Prussia by M. Sydel, the machinery being supplied by Mr. Ruthven. She plied on the Oder as a passenger-steamer for many years, and illustrated favorably some of the characteristic features of the nautilus system. The term of Mr. Ruthven's patent expired, however, before the invention had worked its way into use in England; and the privy council, in 1863, gave a further term of ten years. He afterwards began building a vessel to be called the *Nautilus;* while the admiralty authorized the commencement of the gun-vessel *Waterwitch*, both to be worked on the Ruthven principle.

The *Nautilus* was first tried on the Thames in April, 1866. It is fitted with two steam engines, of 10 (nominal) horse-power eac, with cylinders of 17 in. diameter, and 2 ft. stroke. Water is admitted through apertures in the bottom of the vessel into a water-tight iron case or compartment. In this case is placed a horizontal so-called turbine-wheel, 7 ft. in diameter, acted on from a vertical shaft connected with the steam-cylinders. The wheel is divided into compartments by plates or radii of peculiar curvature, and is placed below the water-line of the vessel, so as to be always immersed. Two pipes extend to the wheel-case, one to either side of the vessel, where they emerge nearly at midship. Each pipe terminates with nozzles, 10 in. in diameter, placed outside the vessel at right angles to the pipes; insomuch that each side of the vessel has a nozzle pointing ahead and another pointing astern. A valve is fitted to each pipe, at its junction with the nozzles, to open the passage to one nozzle and close it against the other; and the movement both of the starboard and the port valves can be governed from a raised deck built over the engine-house. The wheel-case is always full, or nearly full, of water, which enters through the apertures in the bottom of the vessel. When the wheel is made to rotate horizontally by the steam-engines, water is drawn in through the hollow axis, and expelled at the periphery by centrifugal force; it can only find an outlet through the two pipes, and then through the nozzles which terminate them. Supposing the nozzles pointing astern to be open, and those pointing ahead to be closed, the vessel is propelled forward by the resistance of the water of the river or sea to that rushing out of the nozzles; when the forward nozzles are open, and the hinder ones closed, the vessel is propelled backward, or driven astern. The captain, standing on the raised deck, and commanding both valves, can close the fore-nozzles, and open the aft, which makes the vessel go ahead; he can open the fore and close the aft, which makes her go astern; he can open one fore-nozzle, and close the other, which makes her turn. The exit of the water from the nozzles is a little above sea-level, a plan found to be better than actually immersing them. In one of the trial-trips of the *Nautilus*, with strong wind and tide urging her on, and going at full speed, she was stopped dead in less than 10 seconds, and in about a quarter of her length, by simply reversing the valves.

The performance of the *Nautilus* was satisfactory enough to lead the admiralty to expedite the finishing of the *Waterwitch*, an iron-clad gun-vessel of 778 tons and 160 horse-power. The wheel is rotated by an engine having three separate cylinders each 88¼ in. diameter by 3 ft. 6 in. stroke. The vessel was built at the Thames iron-works, and engined by Messrs. J. & W. Dudgeon of Blackwall. Its turbine-wheel is 14 ft. diameter; it rotates (at full engine-power) 39 times per minute. The brass discharge-nozzles, which measure 24 in. by 19¼, are continued along the outside of the vessel 8 ft. on each side of the center; the lower lips of the discharge-nozzles are 8 in. below water-line, the remainder of the aperture being above water. The *Waterwitch* is flat-bottomed and double-ended, i.e., she has a rudder at each end, so that she can steer equally well when going ahead or astern. Her total cost was £60,000, of which no less than £18,600 was for the engines.

As regards her speed and the efficiency of her machinery, the *Waterwitch* did not do all that was expected of her; she was neither more nor less successful than her sister ships, the *Viper* and *Vixen*, and they all three belonged to the slowest class of gun-boats. As her machinery was much more expensive than that of the others, nothing has as yet been done in the way of adding to the number of hydraulic engines in the navy. They possess many advantages in regard to maneuvering the ship, but these are to a great extent also possessed by twin-screw engines, which can be made at a less cost; while some of the advantages originally claimed for them, such as freedom from slip, have not been realized in actual work. In such exceptional vessels as those of the *Viper* class, a fair comparison of the merits of the hydraulic propeller with those in common use cannot be made. The net result of the experiments hitherto made is, that while the addition of one additional part to the machinery between the engines and the actual propellers (which in this case are the columns of water) is open to grave objections; still with a "turbine" less faulty in design, and under more favorable circumstances, the hydraulic propeller may be found useful in men-of-war. The *Waterwitch*, as well as her non-hydraulic sister ships, now ranks among the "inefficients" of the navy, having been pronounced useless for purposes of modern warfare.

NAUVOO', a t. in Illinois, on the e. bank of the Mississippi river, 220 m. above St. Louis. It was built by the Mormons in 1840, and in 1846 contained a population of 15,000. Its principal feature was a great temple of polished marble, original in style, and imposing in appearance. After the murder of Joseph Smith, the Mormon prophet (see MORMONS), and the expulsion of his followers, the temple was burned. The town was afterward bought and occupied by a French socialist community, under the leadership of M. Cabet. This experiment having proved, like others, a failure, the once famous city has been reduced to an inconsiderable village.

NAVA'JOS, a tribe of Indians belonging to the family of Shoshones and Apaches, and occupying a reservation in n.w. New Mexico and n. e. Arizona, comprising nearly 3,500,000 acres. They were formerly hostiles, but were subdued by the U. S. troops, and are at present peaceable and industrious. They number nearly 10,000, and possess 130,000 sheep and goats, and 10,000 horses. A specialty with this tribe is the manufacture of the Navajo blankets, which are valued for their warmth and durability.

NAVAL ACADEMY, U. S. See UNITED STATES NAVAL ACADEMY.

NAVAL ARCHITECTURE. See SHIP-BUILDING.

NAVAL CADETS are the youths training for service as naval officers. Every admiral on hoisting his flag may nominate 2, every capt. 1 cadet. The boy must be between 12 and 13½ years old. He is examined at the royal naval college at Greenwich, and if he passes, is sent for 2 years to the *Britannia* training-ship, at Dartmouth. At the end of that time, if he has progressed satisfactorily, he is put into a sea-going ship, and becomes a midshipman at once if he has gained a first-class certificate.

NAVAL CROWN, in heraldry, a rim of gold round which are placed alternately prows of galleys and square sails. The device is said to have originated with the Roman emperor Claudius, who, after the conquest of Britain, instituted it as a reward for maritime services. He who first boarded the enemy's ship, and was the occasion of its being captured, was entitled to a naval crown. A naval crown supporting the crest in place of a wreath, occurs in various grants of arms in the early part of the present century, to the naval heroes of the late war. The crest of the earl of St. Vincent, bestowed on him after his victory over the Spanish fleet in 1797, is issuing out of a naval crown or, enwrapped by a wreath of laurel vert, a demi-pegasus argent maned and hoofed of the first and winged azure, charged in the wing with a fleur-de-lis or.

NAVAL RESERVE, ROYAL, is a sort of militia, auxiliary to the royal navy. It is a force held in high esteem by naval men; and is considered an extremely valuable reserve of trained men ready to man the fleet in case of emergency. The force was instituted in 1859, under the act 22 and 23 Vict. c. 40. That act authorizes the engagement of 30,000 men, each for a period of 5 years, and provides that each shall be trained, for 28 days in every year, to the use of arms and naval tactics, either in her majesty's ships or on shore. In case of national emergency these men can, by royal proclamation, be called out for service in the navy in any part of the world, for periods not exceeding 5 years. While training and while called out for actual service, the men receive the same wages as corresponding ratings in the royal navy: in addition, they each receive, as retaining fee, a sum of £6 for every year in which the regulated training has been completed. On actual service, after 3 years—whether of uninterrupted service, or at broken intervals—the volunteer becomes entitled to twopence extra per diem. The man can terminate his engagement at the end of 5 years, unless on actual service, when the queen may require him to complete 5 years of such service before discharging him. During the continuance of his engagement, he must not embark on voyages which shall entail a longer absence from the United Kingdom than 6 months, unless with special permission of the admiralty. The periods of training are made as far as practicable to suit the sailor's convenience: he may break the 28 days into shorter periods, none being less than 7 days. He is drilled as near as practicable to his own home, the drilling being intrusted to the officers of the coast-guard. While drilling, if on board a queen's ship, he has the regulation victuals; if billeted on shore, while training for great-gun exercise in batteries, he is allowed 1s. 4d. a day for victuals. It is optional with the volunteer to renew his engagement from time to time, as the respective periods of 5 years expire; and at about the age of 45 he becomes entitled to a pension of £12 or upwards for the rest of his life, subject to the usual obligation of service in certain circumstances in the navy, which all pensioners are under. This pension may be commuted, if desired, into one of less amount, to last until the death of the longest liver of the volunteer and his wife.

To be eligible for the royal naval reserve, a man must be a British subject, under 35 years of age, in good health, and, within the preceding 10 years, must have served at least 5 years at sea, of which 1 year shall have been as able seaman. Soldiers, militiamen, and coast volunteers are ineligible, and subject to a penalty if they join; but a member of the last force may obtain his discharge therefrom for the purpose of joining the naval reserve. Penalties are enacted in case men fail to attend: and failure after proper notice to come up for actual service is held equivalent to desertion. While training or on duty, the men are liable to all the punishments, as they are entitled to all the rights and privileges of regular seamen. The men considered most desirable are (1) those having fixed residences, and personally known to the shipping-master or his deputies; and (2) men having regular employment in the coasting-trade, or in vessels the business of which brings them back to the same ports at frequent and known intervals. In 1880, about 20,000 men belonged to the naval reserve, and were in a state of great efficiency.

In 1861 the system of the reserve was extended—by the act 24 and 25 Vict. c. 129—to officers of the merchant-service, certificated masters and mates being respectively granted commissions in the naval reserve as lieuts. and sub-lieuts. The holders are required to train for 28 days annually on board her majesty's ships, and are liable to be called out for actual service when required. When training, or on actual service, lieuts. receive 10s., and sub-lieuts. 7s. per day, with all the privileges, pensions for wounds, pensions to widows, uniforms, etc., of naval officers of corresponding rank. The number of these officers allowed by regulation is 130 lieuts. and 270 sub-lieuts.: of these, in 1874, commissions had been granted to 117 lieuts., 78 sub-lieuts., and 2 engineers. The total cost of the naval reserve, officers and men, for the year 1876–77, was estimated at £240,109.

NAVAL SIGNALS. Communication between vessels by flags or smoke by day, by lights at night, has always been in practice; as well as a kind of arbitrary code for tacking, etc., etc., when beating through a passage, by the movements of a single flag. The modern systems are by different colored flags by day, and by lanterns or blue-lights at night. The electric light is destined to become of great utility in this line, but whether the flash-light, now extensively used by the English armies, can be used on ship-board, remains to be seen. The signals are numbered, and, in the navy, the signal-book is always bound in lead, and is thrown over on surrender; the admiralty service requiring some fifty flags. The merchant service needs fewer combinations; the present code, that of the British board of trade, introduced just before our last war, needing eighteen flags, covering 20,000 signals, which may represent 70,000 numbers. From the book the number is read off, then the word or sentence opposite, and combinations are made if necessary to complete the communication.

NAVAL TACTICS. Modern naval tactics, as embodying a series of rules for maneuvering to the best advantage, corresponding to what is known on land as "*La grande guerre*," may be said to date only from the time of Cromwell's admiral, Blake. Little change from then till the war of 1812 took place in the general principles of attack, with the single exception of the introduction of reliable mortars, but at that date the invention of the breech-sight altered the conditions of the problems as regards range. The introduction of steam causes the next change at the battle of Navarino, since when evolutions under steam form the subject of greatest consequence. Armor and projectile are constantly opposed, nor is it likely that either can long hold the balance, until the introduction of some extraneous factor, like torpedoes exploded by electricity, shall definitely change the efforts of seamen and constructors to a new direction. Our late war proved that heavy ordnance might be silenced by the successive attack of unarmored vessels; and admiral Tegethoff, at the battle of Lissa, sunk, with wooden ships, the finest iron-clads of that day. In a squadron consisting of eight or more vessels, moving in line, or a column in echelon—that is in column, say, from n. to s., but each vessel heading n.w. movements are executed much on the principles of army tactics—by division, half-division, or single vessels. Thus, from line into column, upon right, left, or center; double column, wheels, changing of front, right about, by either flank, in echelon, and at various distances. Foxhall A. Parker (*Squad. Tactics under Steam*, New York, 1864), then a commander, proposed, as the necessary signals were not in the code, a series of signals for maneuver and change of direction, counting from the right by quarter points. Nos. 1 to 32 indicated points of the compass, and from 33 to 116 orders for movements.

NA'VAN, a market t. of Meath county, Ireland, situated at the junction of the Boyne and Blackwater, 28 m. n.w. of Dublin, with which city it is connected by two railways. Pop. '71, 4,104, of whom 3,868 were Catholics, 203 Episcopalian-Protestants, and the rest Protestants of other denominations. Navan is one of the most ancient boroughs in Ireland, and returned two members to the Irish parliament. It possesses considerable inland trade, a flax-mill, several flour-mills, and two paper-mills, besides a tannery, a brewery, and two distilleries. There are also an endowed school, a Roman Catholic seminary (one of the first opened in Ireland after the repeal of the penal law), and four national schools, containing (1871) 1304 pupils, of whom 699 were boys, and 605 girls. The two girls' schools are attached to the Roman Catholic convent. Several interesting remains, both Celtic and Norman-English, are found in Navan and the vicinity.

NAVARI'NO, or Neo-Castro, a sea-port and citadel on the s.w. coast of the Morea in Greece, contains only 2,000 inhabitants, but is of importance from its position, commanding the entrance of the bay of Navarino, at the southern extremity of which it is situated. On the island of Sphagia or Sphacteria, which closes the bay's mouth, was formerly situated Pylus Messeniaca, the town of Nestor, in a spot where now stands old Navarino or Palæocastron. The bay of Navarino was the scene of a great sea-fight between the Athenians under Cleon, and the Spartans (425 B.C.), in which the latter were defeated; and on Oct. 20, 1827, it saw the annihilation of the Turkish and Egyptian navies by the combined British, French, and Russian fleets under sir Edward Codrington.

NAVARRE', a province, and formerly a kingdom of Spain, is bounded on the n. by France, on the s. and e. by Aragon, and on the w. by the Biscays; and is situated in 42° 20' to 43° 15' n. lat., and 0° 50' to 2° 30' w. long. Area about 4,000 sq. miles. Pop. '70, 318,687. The country is mountainous, being bounded and traversed by the Pyrenees, spurs of which occupy almost the whole of the province in its northern and eastern parts. The highest peaks are Altovisear, Adi, Alcorrunz, and Rufia. Navarre is watered by the Bidassoa, the Anezo, and by the Ebro, together with its tributaries, the Ega and Aragon, on the level shores of which corn, wine, and oil of good quality are produced. Some of the valleys which intersect the mountain-ranges, as those of Roncesvalles, Lescon, Bastan, and Roncal, have a fruitful soil, and yield good crops; but in the mountain districts, husbandry is impracticable, and the inhabitants nearly all follow the chase, as much from necessity as inclination; and while a large number of the Navarrese are soldiers, a still larger proportion are smugglers—the proximity of the province to France, and the dangerous character of the almost inaccessible mountain-passes which alone connect the two countries, holding out many inducements and facilities in the way of smuggling. The mountain forests still harbor bears, wolves, wild-cats, goats, deer, and an abundance of game of every other kind. Iron and salt are the chief mineral products of the district, but these are obtained in sufficient quantities to be exported. The people of Navarre are a hardy, brave, and hospitable race, loyal to the sovereign, attentive observers of the forms of their religion, and, except in the matter of smuggling, honest and moral; but they are passionate and distrustful, prone to anger, and keen in avenging an insult, real or imaginary. Although not industrious, the people follow a few branches of industry, and manufacture glass, leather, soap, chocolate, etc., of good quality.

The Navarrese, with few exceptions, are members of the church of Rome, to whose tenets they cling with superstitious devotion. They have always intermarried chiefly among their own compatriots, and are a nearly pure Basque race. In the mountainous districts, Basque is still spoken, but in the plains, the modern Castilian form of Spanish is rapidly supplanting the ancient language of the country. The chief town is Pamplona (q.v.).

The territory known from an early period of Spanish history under the name of Navarre, was occupied in ancient times by the Vascones, who were subdued by the Goths in the 5th century. After having become gradually amalgamated with their conquerors, the people continued to enjoy a species of turbulent independence under military leaders until the 8th c., when they were almost annihilated by the hordes of Arabs who were rapidly spreading their dominion to all parts of the peninsula. The Gothic Vascones of Navarre, who had been converted to Christianity, offered a gallant resistance to their infidel invaders, and although repeatedly beaten, they were not wholly subdued. The remnant which escaped the sword of their Moslem enemies took refuge in the fastnesses of the mountains, and choosing a knight of their number, Garcia Ximenes, as their leader or king, they sallied forth, and by their gallant resistance, compelled the Arabs to leave them in the enjoyment of an independence greater than that of the neighboring states. On the extinction of the race of Ximenes, in the middle of the 9th c., the Navarrese elected as their king Inigo Sanchez, count of Bigorre, in whose family the succession remained till the marriage of Philip the fair with queen Joanna I. of Navarre; and the accession of the former to the throne of France in 1285, rendered Navarre an appanage of the crown of France. It continued a part of that kingdom during the successive reigns of Louis X., Philip V., and Charles the fair, but on the death of this last in 1328, France fell to the family of Valois, and the daughter of Louis X., the rightful heir, succeeded to Navarre as Joanna II. The events of the kingdom present no features of interest during the next hundred years. The marriage of Blanche, daughter of Charles III. of Navarre, with John II. of Aragon, in 1442, did not produce an annexation of Navarre to Aragon, as John suffered his wife to rule her own kingdom as she pleased, and even after her death and his subsequent re-marriage, he resigned the government entirely to his son by Blanche. This son, known as Charles, prince of Viano, having attempted to remain neutral in his father's quarrels with Castile, John expelled him and his elder sister Blanche, who sided with him, from Navarre, and conferred the kingdom on Leonora countess de Foix, his younger daughter, by Blanche, whose misrule completed the disorganization which these family quarrels had commenced. Her son, Francis, called Phœbus, from his beauty, succeeded in 1479, and his sister Catharine in 1483. Ferdinand and Isabella sought to marry the young queen to their son and heir, the prince of Asturias, but her mother, a French princess, married her to Jean d'Albret. Ferdinand, however, was not willing to let the prize escape him, and on some slight pretext he seized Navarre in 1512. After this act of spoliation, there remained nothing of ancient Navarre beyond a small territory on the northern side of the Pyrenees, which was subsequently united to the crown of France by Henri IV. of Bourbon, king of Navarre, whose mother, Jeanne d'Albret, was granddaughter of queen Catharine; and hence the history of Navarre ends with his accession to the French throne in 1589. The Navarrese were, however, permitted to retain many of their ancient privileges, after their incorporation with the other domains of the Spanish crown, until the reign of queen Isabella II., when the active aid which they furnished to the pretender, Don Carlos, in the rebellion of 1834–39, led to the abrogation of their *fueros*, or national assemblies, and to the amalgamation of their nationality with that of the kingdom at large. In the later Carlist struggle of 1872–76, Navarre was again a principal seat of the war, the inhabitants being stimulated in their assistance of the representative of the claims and title of Don Carlos by his promise of restoring their *fueros*.

NAVARRETE, Domingo Fernandez de, 1610–89; b. Spain; was educated at Valladolid as a Dominican, and in 1647 went on a mission to the Philippine islands, where he soon became professor of theology in the college of Manilla. A few years later, however, he went to China and busied himself in the interior of the country, studying the people and their language until he was persecuted and thrown into prison in Canton. As soon as he escaped and arrived in Europe he visited Rome, and complained to the pope of the work of the Jesuits in China, accusing them of accommodating their religion to the superstition of the natives. He then returned to Spain and published a large work on the *History, Politics, Ethics, and Religion of the Chinese Monarchy,* shortly after which he received the appointment of archbishop of San Domingo in the West Indies, where he passed the remainder of his life.

NAVARRETE, MARTINO FERNANDEZ DE, 1765–1844; b. Spain; entered the Spanish navy in 1780, was present at the attack on Gibraltar in 1782, and afterwards served against the Moors and Algerines. Ill health, however, forced him to retire from the service for some years which he spent in collecting documents respecting the history of Spanish maritime discovery, labors that resulted in 1825 in the publication of the first and second volumes of a work by him entitled *Colleccion de los Viages y Descubrimientos que hicieron por mar los Españoles desde fines del Siglo XV.*, which was pronounced by Humboldt to be "one of the most important historical monuments of modern times." In 1829 the third volume appeared: and eight years later, the fourth and fifth volumes. But before the sixth and seventh were completed the author died. He was the author of several other lesser works, and a distinguished member of the Spanish academy.

NAVAR'RO, a co. in n.e. Texas, on the Trinity river; 1040 sq.m.; pop. '80, 21,705—5,304 colored. The surface is undulating with a large proportion of prairie. The chief productions are corn, cotton, and sweet potatoes. Cattle and pork are raised. It is drained by Chambers and Richland creeks, and is on the Houston and Texas Central railroad. Co. seat, Corsicana.

NAVE. See CHURCH.

NA'VESINK (or NEVERSINK) HIGHLANDS, a chain of hills that form a bold headland along the coast of New Jersey on the border of Monmouth county. To ships approaching New York, they are important landmarks and located on them are two first-class light-houses 53 ft. high, both of which show fixed white lights. Though the neighboring region is a beautiful one and only 20 m. from New York, it remains primitive and only sparsely inhabited.

NA'VEW (Fr. *navette*), a garden vegetable much cultivated in France and other parts of the continent of Europe, although little used in Britain. It is by some botanists regarded as a cultivated variety of *Brassica napus*, or rape (q.v.). whilst others refer it to *B. campestris*, sometimes called wild navew, the species which is also supposed to be the original of the Swedish turnip (q.v.). The part used is the swollen root, which is rather like a carrot in shape. Its color is white. Its flavor is much stronger than that of the turnip. It succeeds best in a dry light soil. The seed is sown in spring, and the plants thinned out to 5 in. apart.

NAVEZ, FRANÇOIS JOSEPH, 1787–1869; b. Belgium; studied art in Brussels and Ghent; and in Paris was a pupil of the great painter David. After finishing his studies he resided in Brussels till his death, and became director of the fine arts academy. His works almost all represent biblical scenes such as: "The Prophet Samuel," "The Ascension of the Virgin," "Hagar in the Desert," and "Meeting of Isaac and Rebecca."

NAVIC'ULA (Lat. a little ship), a genus of *Diatomaceæ* (q.v.), receiving its name from the resemblance of its form to that of a boat. Some of the species are very common.

NAVIC'ULAR DISEASE, in the horse, consists in strain of the strong flexor tendon of the foot, at the point within the hollow of the fetlock, where it passes over the navicular bone. It is most common amongst the lighter sorts of horses, and especially where they have upright pasterns, out-turned toes, and early severe work on hard roads. It soon gives rise to a short tripping yet cautious gait, undue wear of the toe of the shoe, wasting of the muscles of the shoulder, and projecting or "pointing" of the affected limb whilst standing. When early noticed, and in horses with well-formed legs, it is often curable; but when of several weeks standing, it leads to so much inflammation and destruction of the tendon and adjoining parts, that soundness and fitness for fast work are again impossible. Rest should at once be given, the shoe removed, the toe shortened, and the foot placed in a large, soft, hot poultice, changed every few hours. Laxative medicine and bran mashes should be ordered, and a soft bed made with old short litter. After a few days, and when the heat and tenderness abate, cold applications should supersede the hot; and, after another week, a blister may be applied round the coronet, and the animal placed for two months in a good yard or in a grass field, if the ground be soft and moist; or, if sufficiently strong, at slow farm-work on soft land. Division of the nerve going to the foot removes sensation, and consequently lameness; and hence is useful in relieving animals intended for breeding purposes or for slow work. The operation, however, is not to be recommended where fast work is required; for the animal, insensible to pain, uses the limb as if nothing were amiss, and the disease rapidly becomes worse.

NAVIES, Ancient and Mediæval. The ancient method of naval warfare consisted in great part, in the driving of *beaked* vessels against each other: and therefore skill and celerity in maneuvering, so as to strike the enemy at the greatest disadvantage, were of the utmost importance. The victory thus usually remained with the best sailor. This mode of conflict has been attempted to be revived at the present time, and vessels called "steam-rams" are specially constructed for this species of conflict. The earliest powers having efficient fleets appear to have been the Phenicians, Carthaginians, Persians, and Greeks; the Greeks had fleets as early as the beginning of the 7th c. B.C.—the first sea-fight on record being that between the Corinthians and their colonists of Corcyra, 664 B.C. The earliest great battle in which tactics appear to have distinctly been opposed to superior force, and with success, was that of Salamis (480 B.C.), where Themistocles taking advantage of the narrows, forced the Persian fleet of Xerxes to combat in such a manner, that their line of battle but little exceeded in length the line of the much inferior Athenian fleet. The Peloponnesian war, where "Greek met Greek," tended much to develop the art of naval warfare. But the destruction of the Athenian marine power in the Syracusan expedition of 414 B.C., left Carthage mistress of the Mediterranean. The Roman power, however, gradually asserted itself, and after two centuries, became omnipotent by the destruction of Carthage. For several following centuries, the only sea-fights were occasioned by the civil wars of the Romans. Towards the close of the empire, the system of fighting with pointed prows had been discontinued in favor of that which had always co-existed—viz., the running alongside, and boarding by armed men, with whom each vessel was overloaded. Onagers, balistæ, etc., were ultimately carried in the ships, and used as artillery; but they were little relied on, and it was usual, after a discharge of arrows and javelins, to come to close quarters. A sea fight was therefore a hand-to-hand struggle on a floating base, in which the vanquished were almost certainly drowned or slain.

The northern invaders of the empire, and subsequently the Moors, seem to have introduced swift-sailing galleys, warring in small squadrons and singly, and ravaging all civilized coasts for plunder and slaves. This—the break-up of the empire—was the era of piracy, when every nation, which had more to win than lose by freebooting, sent out its cruisers. Foremost for daring and seamanship were the Norsemen, who penetrated in every direction from the Bosporus to Newfoundland. Combination being the only security against these marauders, the mediæval navies gradually sprang up; the most conspicuous being—in the Mediterranean, those of Venice, Genoa, Pisa, Aragon; on the Atlantic sea-board, England and France. In the Mediterranean, Venice, after a long struggle with the Genoese, and subsequently with the Turks, became the great naval power. The Aragonese fleet gradually developed into the Spanish navy, which, by the epoch of Columbus, had a rival in that of Portugal. Many struggles left, in the 16th and 17th centuries, the principal naval power in the hands of the English, French, Dutch, Spaniards, and Portuguese. The present state of these and other existing navies will be briefly given under Navies, Modern.

NAVIES, Modern. Dating the modern navies of the world from the 16th century, we find the British navy rising from insignificance by the destruction of the Spanish armada in 1588; a blow from which Spain never recovered, and which the Dutch, whose naval force had acquired tremendous strength in their struggle for independence, increased the weight of, by their triumph in 1607, in the bay of Gibraltar. At this time there was no decisive superiority of the fleet of England over that of France; but each was inferior to the Dutch navy. The commonwealth and reign of Charles II. were signalized by the struggle for mastery between the English and Dutch; when victory, after many alternations, finally sided with the former. Through the 18th century, the English and French were the principal fleets; but Louis XVI. gave a decided superiority to the navy of France; and at the period of the American war, the naval power of England was seriously threatened. Spain, Holland, and Russia (now for the first time a naval power) had meanwhile acquired considerable fleets; and the "armed neutrality," to which the northern powers gave their adherence rendered the British position most critical. However, the slowly roused energy of her government, the invincible courage of her seamen, and the genius of her admirals brought Britain through all her trials. Camperdown broke the Dutch power; many battles weakened the French navy; and at Trafalgar in 1805, it, with the Spanish power, was swept from the ocean. The United States had in the meantime augmented their fleet, and in the war of 1812–14 maintained a glorious struggle. During the American war of secession many gun-boats, "monitors," and iron-clads of all classes were created; but chiefly adapted for river and coast service. The growth, in recent times, of the British navy will be found under Navy, British. The emperor Napoleon III. greatly enlarged and improved the French navy, yet in the war of 1870–71 it had no opportunity of proving its effectiveness.

The contest between the attack and defense which has been going on for some time appears to have attained its limits in the 100-ton guns of the Italian navy, and the 24-inch armor-plate of the British; and a new departure seems already to have been taken which points in the direction of steel plates and speed, and a more special adaptation of ships for particular services. The torpedo system has introduced a new element into naval warfare, particularly in harbors, rivers, and inland waters, which can hardly be said to be yet fully developed (see TORPEDO); and the catastrophes of the *Vanguard* of the British navy, and the *Grosser Kurfürst* of the German, have pointed out dangers connected with the ram system that had not been calculated upon.

The following table gives a fair estimate of the comparative strength of the chief navies of the world. Comparison by the number of guns is of little account now; that of *armored steamers* and *horse-power* is more to the point:

CHIEF NAVIES OF THE WORLD, 1877.

Country.	Armored Steamers.	Unarmored Steamers.	Sailing Vessels.	Total Ships.	Horse-power.	Guns.	Men.	Annual Cost.
Austria-Hungary	11	37	10	58	16,206	324	9,970	£941,019
Brazil	11	46	3	60	12,027	197	5,097	1,132,000
Denmark	7	21	....	28	....	....	2,964	272,162
France	53	326	113	492	250,324	2,834	71,154	7,439,000
Germany	20	36	4	60	108,300	407	7,435	1,428,850
Great Britain	65	360	125	545	*297,700	*770	*81,400	11,091,392
Greece	2	6	6	14	....	....	653	73,525
Italy	16	70	....	86	41,216	676	16,096	1,836,243
Netherlands	17	68	20	105	....	470	9,346	1,136,049
Portugal	1	26	12	39	4,255	180	3,893	287,853
Russia	29	194	....	223	81,080	548	29,043	3,589,491
Spain	10	71	8	89	23,267	922	15,649	1,039,000
Sweden and Norway	18	58	189	265	8,268	567	....	494,166
Turkey	33,	45	....	78	....	....	34,000	3,000,000
United States	24	70	22	116	....	1,208	8,287	2,848,820

NAVIES, MODERN (*ante*). See UNITED STATES NAVY.

NAVIGATION, ART OF. We shall give a few indications of the manner of conducting the course of a ship at sea, referring to the various headings, such as SEXTANT, LATITUDE and LONGITUDE, GREAT-CIRCLE SAILING, etc., for the more scientific explanation of the operations in use for determining position.

A vessel having completed her lading, she is steered out of port by a pilot, who lays his course by the *ranges* with which long familiarity has made him acquainted. Arrived off soundings, or at a point where his local knowledge is no longer of value, he leaves the vessel to the captain, who then assumes all responsibility. While off the coast the captain steers by his *chart* and by the *lead*, assisted by *landmarks* and *buoys* by day, and by *lights* at night. It is his duty, without waiting for foggy weather, nor for any doubt of his situation, to keep the lead going, and a careful watch, while on soundings. When, finally, he is about to lose sight of the coast, he determines a last position, called the *point of departure*, which serves as the base of his reckoning. The problems involved in a long voyage are many, some intricate, but position is always ascertainable, either by *observations* or *dead reckoning*. Two things must be known, *speed* and *direction*. The first is found by the *log*, whose unit, the *knot*, predicates the number of nautical *miles*, 1851.85 meters, traversed per *hour*. The second is indicated by the *compass*, from which is read the angle, known as the *course*, between the magnetic meridian and the axis of the keel. But to reduce this to the true course with reference to the terrestrial meridian, the magnetic *variation* must be known and applied. The log is not an accurate instrument, nor is it possible, in a sailing vessel, to throw it as often as slight changes in the rate of motion occur; besides, it seldom happens that the course of a vessel is exactly that read from the compass, for decomposing into two forces the normal line of action of the wind on the sails, there results a certain side-push, forming an angle with the keel, and resulting in a falling-off from the true course known as *drift*. Allowance must also be made for the influence of local, tidal, or ocean currents, the force of which, even where not known by experience nor laid down on the chart, must be carefully judged, and anxiously watched for. The amount of drift is ascertained from the *wake*, either by a back-sight of the compass, or by means of a quadrant and eye-pieces, and can be always combined with the magnetic variation to obtain the true course. Then make allowance for the *set* of the current, the effect on a course of given length and direction of the known speed and trend of the stream.

When, as is necessary every day, it is desired to follow a *rhumb-line*, the course is deduced by making allowance inversely for variation, drift, and set. This course the captain lays down, and the officer of the deck continually oversees the steersman, so that, granting this course continually kept, the path of the vessel successively intersects each meridian at the same angle, called the *angle* of *rhumb*, and this line, a curve of double flexure, is the *loxodrome*, or *loxodromic line*. But for a vessel to sail directly from point of departure to destination is almost impossible, whether from baffling winds, intervening coasts, or adverse currents; the best that can be done then is to substitute a series of loxodromic curves, as little removed from the true course as possible, to make as few and as advantageous stretches as possible, and to take advantage of known currents and favorable winds to substitute for a short but questionable passage a more circuitous but quicker route. The log must always be thrown whenever wind, sails, or course may change; the course and the speed are noted, say every half-hour, on a tally, and at the end of each watch the course is transferred to the *log-book*. Finally, every day at noon, or oftener as advisable, the reckoning is cast up, and the position of the vessel marked on the chart, taking as point of departure the last calculated position. The future course is deduced from this. All navigation by reckoning should be checked at least once a day, and as often and in as many different ways as can be accomplished by observations, repeated if possible, and the mean taken.

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* The horse-power and guns of the armored steamers only are given. The number of men includes the royal naval reserve

NAVIGATION, Freedom of, in the open or high seas has been fully established for nearly a century, and such efforts as have been made in the past to claim exclusive jurisdiction were founded rather on national pride or arrogance than on reasonable principles or considerations of commercial value. The most pretentious claims which have been made were those of Spain and Portugal in the 15th c. based on bulls of popes Nicholas V. and Alexander VI., giving Portugal control over the African seas, and dividing between the two the sovereignty of the Pacific. Of course Protestant nations paid no attention to these claims. The true principles of sovereignty in regard to seas, bays, etc., were first laid down by Grotius in his *Mare Liberum*, 1608, but, notwithstanding, his countrymen the Dutch for a long time opposed the right of the Spaniards to trade with the Philippines *via* the cape of Good Hope. In 1635 Selden published *Mare Clausum*, an attempt to refute Grotius and defend the claims of the English to sovereignty over the seas about the United Kingdom as far as to the coasts of other nations. His argument was weak, being based entirely on alleged precedents. The latest serious claim of the kind was that of Russia, which formerly asserted dominion over the Pacific n. of 51° n. lat. on the ground that no other state possessed territory bordering thereon. This was withdrawn in treaties with the United States and Great Britain in 1824–25. But while the open sea is free to all, inland seas are subject to the jurisdiction of the country in which they are situated; and where, as in the Black sea, two nations border on an inland sea, and in the case of gulfs or straits, questions of some difficulty have arisen. It is conceded that marine jurisdiction extends a short way from the coast, a marine league being the generally accepted limit; so also, gulfs and bays belong to the countries owning the promontories between which they lie. But this doctrine must not be carried too far, and the idea suggested by chancellor Kent in the early part of this century, that sovereignty might be in future claimed over the waters inclosed by lines drawn from cape Cod to cape Ann, Nantucket to Montauk Point, thence to the Delaware capes and from the extremity of Florida to the Mississippi (before Texas was annexed), is now considered untenable, as is also the proposition that the line of the gulf stream should bound the sovereignty of the United States. For purposes connected with the laws of revenue and commerce, four leagues are allowed. As to narrow seas, gulfs, and straits, there has existed from time immemorial a claim on the part of England to sovereignty over the English and St. George's channels, the Irish sea and the North channel, and theoretically it may still exist; but long since the only exactions from other nations have been in requiring certain honors to be paid to the British flag, and even this custom has fallen into disuse. Over the Baltic sea Denmark long exercised a rather despotic rule, based partly on the natural position of the sea, partly on precedent, and partly on the cost of maintaining light-houses and signals. Heavy tolls were laid on foreign vessels, and caused the war with the Netherlands in the 17th century. In 1857 the powers agreed to pay Denmark a round sum as compensation for the renunciation of her alleged sovereignty, and the United States paid nearly $400,000 as its share. The questions in regard to the Black sea have had great prominence in the European and Turkish complications of this century. Previous to 1829 Turkey claimed the sole sovereignty. At that date Russia and her allies were admitted to the right of navigation. In 1841 it was agreed that vessels of war should not enter the Bosporus or Dardanelles; while by the treaty of 1856 the Black sea was made neutral, ships of war still being prohibited from entrance, though Russia and Turkey were to allow each other a small naval force for protection of commerce, etc. The action of the Berlin congress of 1878 tends to confirm and strengthen the neutrality of this inland sea. Navigation of rivers has also given rise to questions of international interest, and there has been a constantly increasing freedom and enlargement of the privileges allowed by the country controlling the mouth and lower course to the countries lying above.

NAVIGA'TION, History of. In its widest sense, this subject is divisible into three sections—the history of the progressive improvement in the construction of ships, the history of the growth of naval powers, and the history of the gradual spread and increase of the science of navigation. Although these three sections are to some extent interwoven, the present article will be limited to a consideration of the last, the first two being sufficiently described under Ship-Building and Navies.

The first use of ships, as distinguished from boats, appears to have been by the early Egyptians, who are believed to have reached the western coast of India, besides navigating the Mediterranean. Little, however, is known of their prowess on the waves; and, whatever it may have been, they were soon eclipsed by the citizens of Tyre, who, to make amends for the unproductiveness of their strip of territory, laid the seas under tribute, and made their city the great emporium of eastern and European trade. They spread their merchant fleets throughout the Mediterranean, navigated Solomon's squadrons to the Persian gulf and Indian ocean, and planted colonies everywhere. Principal among these colonies was Carthage, which soon outshone the parent state in its maritime daring. The Carthaginian fleets passed the pillars of Hercules, and, with no better guide than the stars, are believed to have spread northward to the British isles, and southward for some distance along the w. coast of Africa. From the 6th to the 4th centuries B.C., the Greek states gradually developed the art of navigation, and at the time of the Peloponnesian war, the Athenians appear to have been skillful tacticians, capable of concerted maneuvers. The Greeks, however, were rather warlike than commercial in their nautical affairs. In the 4th c. B.C., Alexander destroyed the Tyrian power, transferring its commerce to Alexandria, which, having an admirable harbor, became the center of trade for the ancient world, and far surpassed in the magnitude of its marine transactions any city which had yet existed. Rome next wrested from Carthage its naval power, and took its vast trade into the hands of the Italian sailors. After the battle of Actium, Egypt became a Roman province, and Augustus was master of the enormous commerce both of the Roman and the Alexandrian merchants. During all this period, the size of the vessels had been continually increasing, but probably the form was that of the galley, still common in the Mediterranean, though a more clumsy craft then than now. Sails were known, and some knowledge was evinced even of beating up against a foul wind; but oars were the great motive-power; speed was not thought of, a voyage from the Levant to Italy being the work of a season; and so little confidence had the sailors in their skill or in the stability of their ships (still steered by two oars projecting from the stern), that it was customary to haul the vessels up on shore when winter set in. During the empire, no great progress seems to have been made, except in the size of the vessels; but regular fleets were maintained, both in the Mediterranean and on the coast of Gaul, for the protection of commerce. Meanwhile the barbarian nations of the north were advancing in quite a different school. The Saxon, Jutish, and Norse prows began to roam the ocean in every direction; in small vessels they trusted more to the winds than to oars, and, sailing singly, gradually acquired that hardihood and daring which ultimately rendered them masters of the sea. The Britons were no mean seamen, and when Carausius assumed the purple in their island, he was able, for several years, by his fleets alone to maintain his independence against all the power of Rome.

The art of navigation became almost extinct in the Mediterranean with the fall of the empire; but the barbarous conquerors soon perceived its value, and revived its practice with the addition of new inventions suggested by their own energy. The islanders of Venice, the Genoese, and the Pisans, were the carriers of that great inland sea. Their merchants traded to the furthest Indies, and their markets became the exchanges for the produce of the world. Vast fleets of merchant galleys from these flourishing republics dared the storm, while their constant rivalries gave occasion for the growth of naval tactics. So rich a commerce tempted piracy, and the Moorish corsairs penetrated everywhere on both sides of the straits of Gibraltar in quest of prey; evincing not less skill and nautical audacity than savage fury and inhuman cruelty. But the Atlantic powers, taught in stormy seas, were rearing a naval might that should outrival all other pretenders. The Norsemen extended their voyages to Iceland, Greenland, and Newfoundland, while they first ravaged and then colonized the coasts of Britain, France, and Sicily. The sea had no terrors for these hardy rovers; their exploits are imperishably recorded in the Icelandic sagas, and in the numerous islands and promontories to which they have given names.

Early in the 15th c. the introduction of the mariner's compass rendered the seaman independent of sun and stars—an incalculable gain, as was soon shown in the ocean-voyages of Columbus, Cabot, and others. In 1492 Columbus rendered navigation more secure by the discovery of the variation of the compass. Between that and 1514 the "cross-staff" began to be used; a rude instrument for ascertaining the angle between the moon and a fixed star, with the consequent longitude. Early in the 16th c., tables of declination and ascension became common. In 1537 Nuñez (Nonius), a Portuguese, invented various methods of computing the rhumb-lines and sailing on the great circle. In 1545 the two first treatises on systematic navigation appeared in Spain, one by Pedro de Medina, the other by Martin Cortes. These works were speedily translated into French, Dutch, English, etc., and for many years served as the text-books of practical navigation. Towards the end of the century, Bourne in England, and Stevin in Holland, improved the astronomical portion of the art, while the introduction of time-pieces and the log (q.v.) rendered the computation of distance more easy.

It would be tedious to enumerate the successive improvements by which the science of navigation has been brought to its present high perfection; but as conspicuous points in the history of the art, the following stand out: The invention of Mercator's chart in 1569; the formation by Wright of tables of meridional parts, 1597; Davis's quadrant, about 1600; the application of logarithms to nautical calculations, 1620, by Edmund Gunter; the introduction of middle-latitude sailing in 1623; the measure of a degree on the meridian, by Richard Norwood, in 1631. Hadley's quadrant, a century later, rendered observations easier and more accurate; while Harrison's chronometers (1764), rendered the computation of longitude a matter of comparatively small difficulty. Wright, Bond, and Norwood were the authors of scientific navigation, and their science is now made available in practice by means of the *Nautical Almanac*, published annually by the British admiralty. The more important points of the science of navigation are noticed under such heads as DEAD-RECKONING, LATITUDE AND LONGITUDE, GREAT-CIRCLE SAILING, SAILINGS, etc.

NAVIGATION, INLAND. See APPENDIX.

NAVIGATION, LAWS AS TO. By the law of nature and of nations, the navigation of the open sea is free to all the world. The open sea means all the main seas and oceans beyond 3 m. from land. The sea within 3 m. from land is called the territorial sea, and each state has a kind of property in such sea, and has a right to regulate the use thereof. Hence, it was natural that in early times, before the laws of commerce were properly understood, each state should endeavor to exclude foreigners from that part of the sea so as to secure to its own subjects the benefits of the carriage of goods in ships. which has always been an increasing source of wealth. In England, however, as in most countries, the first care seems to have been bestowed on the navy, as the great means of defending the realm against enemies, and trading-ships came to be first subject to statutory regulation only as being in some way ancillary to the interests of the navy. The laws of Oleron were the first code of maritime laws which obtained notice as well as general acceptance in Europe, in the time of Edward I., and the authorship of those laws is claimed by Selden and Blackstone for Edward I., though the point is disputed by the French writers. By a statute of Richard II., in order to augment the navy of England, it was ordained that none of the lieges should ship any merchandise out of the realm except in native ships, though the statute was soon varied and seldom followed. At length, in 1650, an act was passed with a view to stop the gainful trade of the Dutch. It prohibited all ships of foreign nations from trading with any English plantation without a license from the council of state. In 1651 the prohibition was extended to the mother-country, and no goods were suffered to be imported into England or any of its dependencies in any other than English bottoms, or in the ships of that European nation of which the merchandise was the genuine growth or manufacture. At the restoration, these enactments were repeated and continued by the navigation act (12 Chas. II. c. 18). with the further addition, that the master and three-fourths of the mariners should also be British subjects. The object of this act was to encourage British shipping, and was long believed to be wise and salutary. Adam Smith, however, had the sagacity to see that the act was not favorable to foreign commerce or to opulence, and it was only on the ground that defense was more important than opulence, that he said it was, "perhaps the wisest of all the commercial regulations of England." In 1826 the statute 4 Geo. IV. c. 41 repealed the navigation act, and established a new system of regulations, which were further varied by subsequent statutes, till, under the influence of the free-trade doctrines, new statutes were passed, which reversed the ancient policy. By the law, as now altered, foreign vessels are allowed free commercial intercourse and equality with the ships of this country and its dependencies, except as regards the coasting trade of the British possessions in Asia, Africa, and America, for the coasting trade of the United Kingdom is now entirely thrown open to all comers. The advantages of equality and free trade are, however, so far qualified, that in the case of the ships of those nations which do not concede to British ships like privileges, prohibitions and restrictions may be imposed by order in council.

As regards those laws of navigation which affect the property and management of ships, a complete code of regulations is contained in the merchant shipping acts, which are 17 and 18 Vict. c. 104, 18 and 19 Vict. c. 91, 25 and 26 Vict. c. 63, 34 and 35 Vict. c. 110, 36 and 37 Vict. c. 85. 1. As to ownership, registration, and transfer of merchant-ships. No ship is deemed a British ship unless she belong wholly to natural born subjects, denizens, naturalized persons, or bodies corporate, having a place of business in the United Kingdom or some British possession. Every British ship, with a few exceptions as to old ships and small vessels. must be registered, otherwise, it is not entitled to the protection of the British flag. The commissioners of customs indicate at what port in the United Kingdom ships may be registered by their officers. and when registered. the ship is held to belong to that port. The name of the ship and its owners must be stated; and as regards joint-ownership. a ship is capable only of being subdivided into 64 shares, and not more than 32 owners shall own one ship. These registered owners are deemed the legal owners. and so long as the register is unchanged. the ship is held still to belong to them. The only way of transferring the property is by bill of sale under seal; or if a mortgage is made, it must be made in a particular form, and duly registered. and the priority of title as between several mortgages is regulated by the date of the entry in the register. 2. As regards the laws concerning merchant seamen, there is established in every such seaport a superintendent. whose business it is to afford facilities for engaging seamen, by keeping registers of seamen and superintending the making and discharging of contracts. No person is allowed to be employed in a foreign-going ship as master. or as first, or second. or only mate, or in a home-trade passenger-ship as master, or first or only mate, unless he has a certificate of competency or a certificate of service, issued by the board of trade only to those who are deemed entitled thereto. The master of every ship above 80 tons burden shall enter into an agreement, of a certain form, with every seamen he carries from the United Kingdom, and in which the names of the seamen, wages, provisions, capacity of service, etc., are set forth. The seamen are not to lose their wages though no freight is earned, or the ship lost. The men are also to have a berth of a certain size, and the ship to be supplied with medicines, log-book, etc. In order to secure general information, every master of a foreign-going ship is bound, within 48 hours after arriving at the final port of destination in the United Kingdom, to report his ship. Unseaworthy or over-loaded ships may be surveyed by the board of trade, and detained. 3. As regards the liability of ship-owners for loss or damage, it is provided by statute, that no owner of a sea-going ship shall be liable to make good any loss or damage occurring without his actual fault or privity, to goods or things on board, by reason of fire on board the ship; or to any gold, silver, diamonds, watches, jewels, or precious stones on board, by reason of robbery or embezzlement, unless the true nature and value of such articles have been inserted in the bill of lading. And in cases where loss to goods occurs without his actual fault or privity, the owner shall not be liable in damages to an aggregate amount exceeding £8 per ton of the ship's tonnage. In case of loss of life or personal injury caused by mismanagement of the ship, but without the actual fault or privity of the owners, they shall not be liable beyond £15 per ton. In case of accidents, whereby a large number of persons have been killed or injured, and to prevent a multiplicity of actions, the sheriff of the county is to impanel a jury, and inquire into the question of liability. If the owners are found liable, then £30 is to be assessed as the damages for each case of death or personal injury. In case of death, such sum is to be paid to the husband, wife, parent, or child of the deceased. If any person consider this is not sufficient damages, then, on returning such sum, he may commence an action; but unless he recover double that sum, he must pay costs. See also PILOTS and LIGHT-HOUSES.

NAVIGATION LAWS (*ante*). In regard to United States laws of navigation affecting the property in and management of ships, see SHIPPING, LAW OF. Only the regulation of congress in regard to the motions of ships coming near each other in such a way as to make a collision possible will be here considered. These regulations, which will be carried into effect in the courts of the United States, are also enforced in most commercial countries; and have taken the place of the general rules of the maritime law. They are the same which were adopted by France and Great Britain in 1863, and have since been agreed to by the United States and Canada, the chief continental commercial powers, Brazil, and the South American republics. Every steamship under sail and not under steam is to be considered a sailing-ship; and every steamship under steam, whether under sail or not, is to be considered a ship under steam. Every steam vessel under way must carry at the foremast head a white light; on the port side a red light; on the starboard side a green light; and both the green and red side-lights are to be fitted with inboard screens so as to keep the lights from being seen across the bow. Steamships towing other ships must carry two bright white lights vertically beside their side-lights to prevent them from being confounded with other steamships. Sailing-ships under way, or being towed, carry the same lights as steamships, with the exception of mast-head lights. Both steamships and sailing-vessels, when at anchor in roadsteads, shall exhibit a white light. Sailing pilot-vessels carry a white light at the mast-head, and show a flare-up light every 15 minutes. In case of a fog signals are to be sounded at least every 5 minutes. Steamships and sailing-vessels not under way sound a bell. Steamships under way sound a steam-whistle. Sailing vessels under way sound a fog-horn. A steamship coming near enough to a ship to make collision probable must stop and reverse. If two ships under steam are crossing each other, the ship which has the other on her starboard side must keep out of the other's way. If two sailing-ships meet end on so as to hazard collision the helms of both shall be put to port; and so with steamships. A vessel overtaking another must keep out of the latter's way. If two sailing-ships cross each other with the wind on different sides the one with the wind on the port side must keep out of the way of the one with the wind on the starboard side; but if they have the wind on the same side, or one has the wind aft, the one to windward must keep out of way of the one to leeward.

NAVIGATION, OCEAN STEAM. See STEAM NAVIGATION.

NAVIGA'TORS' or **SAMO'AN ISLANDS**, a group of nine islands, with some islets, in the Pacific ocean, lying n. of the Friendly islands, in lat. 13° 30′ to 14° 30′ s. and long. 168° to 173° west. The four principal islands of the group are Mauna, Tutuila, Upolu, and Savaii. Of these, Savaii, 40 m. in length by 20 m. broad, and having a population of 20,000, is the largest. Area of the group estimated at 2,650 sq.m.; pop. about 56,000. With the exception of one (Rose island), the Navigators' islands are all of volcanic origin. For the most part they are lofty, and broken and rugged in appearance, rising in some cases to upwards of 2,500 ft. in height, and covered with the richest vegetation. The soil, formed chiefly by the decomposition of volcanic rock, is rich, and the climate is moist. The forests, which include the bread-fruit, the cocoanut, banana, and palm trees, are remarkably thick. The orange, lemon, tacca (from which a kind of sago is made), coffee, sweet-potatoes, pine-apples, yams, nutmeg, wild sugar-cane, and many other important plants, grow luxuriantly. Until recently, when swine, horned-cattle, and horses were introduced, there were no traces among these islands of any native mammalia, except a species of bat. The natives are well-formed (especially the males), ingenious, and affectionate. The women, who superintend the indoor work and manufacture mats, are held in high respect. There are English and American mission-stations on the islands, as well as several Roman Catholic establishments, and many of the natives have embraced Christianity. The government is in the hands of the hereditary chiefs. In 1875 col. Steinberger, from the United States, established himself as (virtually) dictator of the Navigators' islands; but was removed by the commander of a British war-vessel in 1876. Trade is carried on with Sydney.

NAVY, British. Owing to the insular position of Great Britain her navy has long been considered a matter of vital importance, and is the service in which every inhabitant takes a peculiar pride. In considering the history of the British navy it is convenient to divide the subject into *matériel* and *personnel.* The latter had no distinct organization till the time of Henry VIII.; but of the former, we recognize in the earliest times the germ of subsequent glories. Carausius, a Roman general, who had thrown off his dependence on the empire, maintained himself in England for several years by his fleet, with which he prevented the imperial forces from reaching the island. The Saxons brought maritime prowess with them to the British shores, but appear soon to have lost it amid the rich provinces in which they settled. Some organization for the defense of the coast was, however, maintained; and Alfred the great availed himself of it to repulse the Danes; he at the same time raised the efficiency of his navy by increasing the size of his galleys, some being built which were capable of being rowed by thirty pair of oars. Under his successors the number of vessels increased, and both Edward and Athelstan fought many naval battles with the Danes. Edgar aspired to be lord of all the northern seas, and had from three to five thousand galleys, divided into three fleets on the western, southern, and eastern coasts respectively; but the size of most of these ships was very insignificant, and the greater part were probably mere row-boats. Ethelred II. formed a sort of naval militia, enacting that every owner of 310 hides of land should build and furnish one vessel for the service of his country.

William the conqueror established the Cinque ports, with important privileges, in return for which they were bound to have at the service of the crown for 15 days in any emergency 52 ships carrying 24 men each. Richard I. took 100 large ships and 50 galleys to Palestine. John claimed the sovereignty of the seas, and required all foreigners to strike to the English flag; a pretension which has been the cause of some bloody battles, but which England proudly upheld in all dangers. (This honor was formally yielded by the Dutch in 1673, and the French in 1704; and, although not now exacted in its fullness, the remembrance of the right survives in requiring foreign vessels to salute *first*). In the same king's reign a great naval engagement with the French took place (1293) in mid-channel, when 250 French vessels were captured. The Edwards and the Henries maintained the glory of the British flag; Edward III., in person, with the Black Prince, at the battle of Sluys, in 1340, defeated a greatly superior French fleet, with 40,000 men on board. Henry V. had "grete shippes, carrakes, barges, and ballyngers;" and at one time collected vessels enough to transport 25,000 men into Normandy. Henry VII. was the first monarch who maintained a fleet during peace; he built the *Great Harry*, which was the earliest war-vessel of any size, and which was burned at Woolwich in 1553.

To Henry VIII., however, belongs the honor of having laid the foundation of the British navy as a distinct service. Besides building several large vessels, of which the *Henry Grace de Dieu*, of 72 guns, 700 men, and probably about 1000 tons, was the most considerable, he constructed a permanent personnel, defining the pay of admirals, vice-admirals, captains, and seamen. He also established royal dockyards at Deptford, Woolwich, and Portsmouth; and for the government of the whole service instituted an admiralty and navy-board, the latter being the forerunner of the present Trinity board. When this king died he left 50 ships of various sizes manned by about 8,000 hands.

Under Edward VI. the navy fell off, but was sufficiently important in the succeeding reign for the English admiral to exact the salute to his flag from Philip II. with a larger Spanish fleet when the latter was on his way to espouse queen Mary. Elizabeth had the struggle with the Spanish armada to try her navy, and left 42 ships, of 17,000 tons in all, and 8,346 men—15 of her ships being upwards of 600 tons. From this period the tonnage of the ships steadily increased. Under James I. and Charles I. Mr. Phineas Pett, M.A., the first scientific naval architect, remodeled the navy, abolishing the lofty forecastles and poops, which had made earlier ships resemble Chinese junks. In 1610 he laid down the *Prince-Royal*, a two-decker, carrying 64 large guns; and in 1637 from Woolwich he launched the celebrated *Sovereign of the Seas*, the first three-decker, and certainly the largest ship hitherto constructed on modern principles. She was 232 feet in length, of 1637 tons, and carried at first 130 pieces of cannon; but being found unwieldy, was cut down, and then proved an excellent ship. She was burned in 1696.

Prince Rupert's devotion to the crown was bad for the navy, for he carried off 25 large ships; and Cromwell, on acceding to power, had but 14 two-deckers. His energy, however, soon wrought a change, and in five years he had 150 ships, of which a third were of the line; his crews amounted to 20,000 men. During the protectorate, Peter

Pett, son of Phineas, built the *Constant Warwick*, the earliest British frigate, from a French design and pattern. Cromwell first laid navy estimates before parliament, and obtained £400,000 a year for the service. The duke of York, afterwards James II., assisted by the indefatigable Mr. Samuel Pepys, did much for the navy, establishing the system of admiralty government much on its present footing. In his time, sir Anthony Deane improved the model of ships of war, again after a French design. James left, in 1688, 108 ships of the line, and 65 other vessels; the total tonnage of the navy, 101,892 tons; the armament, 6,930 guns; and the personnel, 42,000 men. William III. sedulously augmented the force, foreseeing its importance to his adopted country. When he died, there were 272 ships of 159,020 tons, when the annual charge for the navy had risen to £1,056,915. George II. paid much attention to his fleets, and greatly augmented the size of the ships; he left, in 1760, 412 ships of 321,104 tons. By 1782 the navy had risen to 617 sail of 500,000 tons; and by 1802 to 700 sail, of which 148 were of the line. In 1813 there were 1000 ships (256 of the line), measuring about 900,000 tons, and carrying 146,000 seamen and marines, at an annual charge of about £18,000,000. Since the peace in 1815 the number of vessels has been greatly diminished, although their power has vastly increased.

The progressive augmentation of size in vessels may be judged from the increase in first-rates. In 1677 the largest vessel was from 1500 to 1600 tons; by 1720, 1800 had been reached: by 1745, 2,000 tons; 1780, 2,200 tons; 1795, 2,350 tons; 1800, 2,500 tons; 1808, 2,616 tons; 1853, 4,000 tons. From 1841 a gradual substitution of steam for sailing vessels began, which was not completed, however, till 1859. Since 1860 another reconstruction has taken effect, armor-plated frigates, impervious to ordinary shot, armed either as broadside vessels or in turrets, being substituted for timber vessels. At the same time three and two deckers have ceased to be employed, enormous frigates and turret-ships replacing them of a tonnage far exceeding the largest three-deckers of former times; they mount fewer guns, but those they carry are of stupendous caliber, and of rifled bore. The *Northumberland*, one of the largest frigates of this new class, is of 6,621 tons, 1350 horse-power, and 38 large guns, while the *Devastation* carries 4 great guns in turrets of the most massive armor. The *Inflexible* (turret-ship) carries four 81-ton guns, and is supposed to be the most powerful war-ship in the world.

On April 1, 1874, the effective vessels of the navy were as follows: 33 armor-plated frigates (3 building); 14 turret vessels (2 building); 3 armor-plated corvettes, and 2 sloops; 8 floating-batteries; 3 armored gunboats; 37 ships of the line (10 without steam); 43 frigates (7 without steam); 42 corvettes (7 building, 5 without steam); 46 sloops (3 building, 4 without steam); 43 gun-vessels; 69 smaller steamers (10 building); 71 gunboats; with 17 transports, 6 yachts, and 5 schooners; giving a total of 424 vessels. At the end of 1877 there were in all 249 ships in commission, exclusive of Indian troop-ships. The personnel of the navy amounted in 1877 to 60,000 men including 14,000 marines, but excluding artificers and laborers in dockyards; the armament being about 5,000 guns, mostly of heavy caliber. The annual charge for 1874–75 was estimated at £10,179,485, which may be thus broadly subdivided (in 1878–79 it was £11,058,091):

Wages, victuals, and clothing of officers and men	£3,667,021
Admiralty office	178,066
Coast-guard and naval reserve	163,311
Scientific branch (surveying, hydrography, etc.)	111,170
Dockyards and victualing yards	1,253,211
Stores for building and repairing ships	1,851,063
Miscellaneous services	964,117
Half-pay and pensions	1,815,926
Conveyance of troops	175,600
	£10,179,485

Information on the various points of detail connected with the navy, will be found under the respective heads, as ADMIRAL, CAPTAIN, HALF-PAY, SHIP-BUILDING, SIGNALS, etc.

NAX'OS, the largest, most beautiful, and most fertile of the Cyclades, is situated in the Ægean, midway between the coasts of Greece and Asia Minor. Extreme length, about 20 m.; breadth, 15 miles. Pop. about 12,000. The shores are steep, and the island is traversed by a ridge of mountains, which rise in the highest summit, Dia, upwards of 3,000 feet. The plains and valleys are well watered; the principal products and articles of export are wine, corn, oil, cotton, fruits, and emery. The wine of Naxos (the best variety of which is still called in the islands of the Ægean, *Bacchus-wine*) was famous in ancient as it is in modern times, and on this account the island was celebrated in the legends of Dionysius, and especially in those relating to Ariadne. Among its antiquities are a curious Hellenic tower, and an unfinished colossal figure, 34 ft. long, still lying in an ancient marble quarry in the north of the island, and always called by the natives a figure of Apollo. It was ravaged by the Persians, 490 B.C., and after the conquest of Constantinople by the Latins, became the seat of a dukedom, founded by the Venetians. It now forms a portion of the kingdom of Greece (q.v.). Naxos, the capital, with a population of about 5,000, is situated on the n.w. coast, contains 16 Greek and 4 Catholic churches, and 3 convents, and is the seat of a Greek and a Latin bishop.

NAYLOR, JAMES, about 1616-60; b. in Yorkshire, England, of humble parentage. In 1641 he became an adherent of the parliament, and served for about 8 years under Fairfax and Lambert, rising to the rank of quartermaster. The fanatical religious movements of the time seem to have completely overthrown his judgment; he was first a Presbyterian, then an Independent, and in 1651 was led by George Fox to become a Quaker. His ignorant exhortations and frenzied ravings soon caused the main body of Quakers to disown him, but he found a few deluded people who regarded him as an inspired prophet, and followed him from place to place. He suffered and perhaps encouraged these disciples to regard him as a forerunner of Christ, and when he was released from imprisonment at Exeter in 1656, they spread their garments in his path in imitation of the Savior's entrance into Jerusalem. Naylor was at once arrested on charges of blasphemy, tried before parliament, and sentenced to stand in the pillory for two hours, to be whipped at the cart's-tail from Palace-yard to the exchange, the letter B was to be branded on his forehead, and his tongue to be bored by a red-hot iron. After this he was to be taken to Bristol, whipped through that town, and then to be imprisoned for two years. The whole punishment was inflicted. Naylor recanted his errors, and was again received by the society of Quakers. A collection of his writings was published in 1716, and his *Memoirs* in 1719 and reprinted in 1800.

NAZAREANS. See CHRISTIANS OF ST. JOHN.

NAZARENE' (Gr. *Nazarenos* and *Nazaraios*, an "inhabitant of Nazareth"), was used by the Jews as one of the designations of our Lord, and afterward became a common appellation of the early Christians in Judæa. Although, originally, it is but a local appellation, there can be no doubt that as Nazareth was but a second-rate city of the despised province of Galilee, it was eventually applied to our Lord and his followers as a name of contempt (John xviii. 5, 7; Acts xxiv. 5). For the Judaizing sect called Nazarenes, see EBIONITES.

NAZ'ARETH, a small t. or v. of Palestine, anciently in the district of Galilee, and in the territory of the tribe of Zebulon, 21 m. s.e. of Acre. It lies in a hilly tract of country, and is built partly on the sides of some rocky ridges, partly in some of the ravines by which they are seamed. It is celebrated as the scene of the Annunciation, and the place where the Savior spent the greater part of his life in obscure labor. Pop., according to Dr. Robinson, 3,120, of whom 1040 are Greeks, 520 Greek Catholics, 480 Latins, 400 Maronites, and 680 Mohammedans. Porter thinks 4,000 a moderate estimate. In the earliest ages of Christianity, Nazareth was quite overlooked by the church. It did not contain a single Christian resident before the time of Constantine, and the first Christian pilgrimage to it took place in the 6th century. The principal building is the Latin convent, reared, according to pious tradition, on the spot where the angel announced to the Virgin the birth of her Savior-son; but the Greeks have also erected, in another part of Nazareth, a church on the scene of the Annunciation. Besides these rival edifices, the traveler is shown a Latin chapel, affirmed to be built over the "workshop of Joseph;" also the chapel of "the Table of Christ" (*Mensa Christi*), a vaulted chamber containing the veritable table at which our Lord and his disciples used to eat; the synagogue out of which he was thrust by his townsmen; and "the Mount of Precipitation," down which he narrowly escaped being cast headlong. The women of the village have been long famous for their beauty.

NAZ'ARITES (from Heb. *nazar*, to separate), denoted among the Jews those persons, male or female, who had consecrated themselves to God by certain acts of abstinence, which marked them off, or "separated them," from the rest of the community. In particular, they were prohibited from using wine or strong drink of any kind, grapes, whether moist or dry, or from shaving their heads. The law in regard to Nazarites is laid down in the book of Numbers (vi. 1-21). The only examples of the class recorded in Scripture are Samson, Samuel, and John the Baptist, who were devoted from birth to that condition, though the law appears to contemplate temporary and voluntary, rather than perpetual Nazariteship.

NEAGH, LOUGH, the largest lake of the British islands, is situated in the province of Ulster, Ireland, and is surrounded by the counties of Armagh, Tyrone, Londonderry, Antrim, and Down. It is 18 m. (English) in length, and 11 m. in breadth, contains 98,255 acres, is 120 ft. in greatest depth, and is 48 ft. above sea level at low water. It receives the waters of numerous streams, of which the principal are the Upper Bann, the Blackwater, the Moyola, and the Main; and its surplus waters are carried off northward to the north channel by the Lower Bann. Communication by means of canals subsists between the lough and Belfast, Newry, and the Tyrone coal-field. In some portions of the lough the waters show remarkable petrifying qualities, and petrified wood found in its waters is manufactured into hones. The southern shores of the lough are low and marshy, and dreary in appearance. It is well stocked with fish, and its shores are frequented by the swan, heron, bittern, teal, and other water-fowl.

NEAGLE, JOHN, 1799-1865; b. Mass.; began the study of painting as a coachmaker's apprentice, residing in Philadelphia, and at the age of 19 took his first sketches from life. In 1820 he married the daughter of the painter, Thomas Sully. In 1826 his picture "Patrick Lyon, the Blacksmith" brought him some distinction. He painted the portraits, among other celebrities, of Washington, now in Independence hall, Philadelphia; Gilbert Stuart, Mrs. Wood as *Amina*, Mathew Carey, Henry Clay, Dr. Chapman, and commodore Barron.

NEAL, Alice Bradley. See Haven.

NEAL, Daniel, a dissenting minister and author, was b. in London, Dec. 14, 1678. He was educated first at Merchant Taylor's school, and afterwards at Utrecht and Leyden, in Holland, and in 1706 succeeded Dr. Singleton as pastor of a congregation in his native city. Neal's first work was a *History of New England* (1720), which met with a very favorable reception in America. Two years afterwards he published a tract entitled *A Narrative of the Method and Success of Inoculating the Small-pox in New England by Mr. Benjamin Colman*, which excited considerable attention; but the production on which his reputation rests is his *History of the Puritans* (4 vols. 1732–38), a work of great labor, and invaluable as a collection of facts and characteristics both to churchmen and dissenters, though, of course, written in the interest of the latter. It involved its author in several controversies, which failing health rendered it impossible for him to prosecute. Neal died at Bath, April 4, 1743.

NEAL, John, an American author and poet, of Scottish descent, was b. at Falmouth, now Portland, Maine, Aug. 25, 1793. His parents belonged to the society of Friends, of which he was a member until disowned, at the age of 25, because he failed to live up to the rule of "living peaceably with all men." With the scanty education of a New England common school, he became a shop-boy at the age of 12; but learned and then taught penmanship and drawing. At the age of 21 he entered a haberdashery trade, first in Boston and then in New York; and a year after became a wholesale jobber in this business at Baltimore, in partnership with another American literary and pulpit celebrity, John Pierpont. They failed in 1816, and Neal turned his attention to the study of law. With the energy which acquired for him the *sobriquet* of "Jehu O'Cataract," affixed to his poem *The Battle of Niagara*, he went through the usual seven years' law-course in one, besides studying several languages, and writing for a subsistence. In 1817 he published *Keep Cool*, a novel; the next year a volume of poems; in 1819 *Otho*, a five-act tragedy; and in 1823 four novels—*Seventy-six*, *Logan*, *Randolph*, and *Errata*. These impetuous works were each written in from 27 to 39 days. In 1824 he came to England, where he became a contributor to *Blackwood's* and other magazines and reviews, and enjoyed the friendship and hospitality of Jeremy Bentham. On his return to America he settled in his native town, practiced law, wrote, edited newspapers, gave lectures, and occupied his leisure hours in teaching boxing, fencing, and gymnastics. Among his numerous works are *Brother Jonathan; Rachel Dyer; Bentham's Morals and Legislation; Authorship; Down-easters*, etc. After a long silence, devoted to professional business, he published, in 1854, *One Word More*, and in 1859, *True Womanhood*. The latter work, though a novel, embodies the more serious religious convictions of his later years. In 1870 appeared his *Wandering Recollections of a Somewhat Busy Life*. Neal's voluminous writings, with all their glaring faults of haste and inexperience, are full of genius, fire, and nationality.

NEAL, Joseph Clay, 1807–48; b. N. H. He settled in Philadelphia, where in 1831 he became editor of *The Pennsylvanian*, a democratic journal. In 1844 he founded the *Saturday Gazette*, which had a large circulation. His best-known book, *Charcoal Sketches; or, Scenes in a Metropolis*, enjoyed a considerable degree of popularity and was republished in London. He wrote also *Peter Ploddy and Other Oddities*, and a second series of *Charcoal Sketches*.

NEALE, John Mason, 1818–66; b. London. After graduating from Trinity college, Cambridge, he took orders in the Church of England. In 1846 he became incumbent of Crawley and warden of Sackville college, East Grinstead. On nine occasions between 1845 and 1861 he gained the Seatonian prize for an English sacred poem. His published writings on theological and ecclesiastical subjects amount to no less than seventy volumes, of which the best known are: *The History of the Holy Eastern Church; the Patriarchate of Alexandria; Mediæval Preachers; History of the so-called Jansenist Church of Holland; Essays on Liturgiology and Church History; Mediæval Hymns from the Latin*, and *Hymns of the Eastern Church*. He issued, also, a revised edition of Bunyan's *Pilgrim's Progress* for the use of children, which, on account of his notes, was the cause of considerable controversy. He was distinguished as a champion of the ritualistic party in the English church, and as the founder of the Anglican sisterhood of St. Margaret, East Grinstead.

NEALE, Rollin Heber, d.d., 1808–79; b. Conn.; educated at Columbian college, and in 1838 called to the pastorate of the First Baptist church in Boston, of which he was pastor for over 50 years. He published *The Incarnation; The Burning Bush; Religious Liberty*, and *Holding forth the Word of Life*.

NEANDER, Johann August Wilhelm, by far the greatest of ecclesiastical historians, was born at Göttingen, Jan. 16, 1789, of Jewish parentage. His name prior to baptism was David Mendel. By the mother's side, he was related to the eminent philosopher and philanthropist Mendelssohn (q.v.). He received his early education at the Johanneum in Hamburg, and had for companions, Varnhagen von Ense, Chamisso the poet, Wilhelm Neumann, Noodt, and Sieveking. Already the abstract, lofty, and pure genius of Neander was beginning to show itself. Plato and Plutarch were his favorite classics as a boy; and he was profoundly stirred by Schleiermacher's famous *Discourses on Religion* (1799). Finally, in 1806, he publicly renounced Judaism, and was baptized, adopting, in allusion to the religious change which he had experienced, the name of Neander (Gr. *neos*, new; *aner*, a man), and taking his Christian names from several of his friends. His sisters and brothers, and later his mother also, followed his example. He now proceeded to Halle, where he studied theology with wonderful ardor and success under Schleiermacher, and concluded his academic course at his native town of Göttingen, where Planck was then in the zenith of his reputation as a church historian. In 1811 he took up his residence at Heidelberg university as a privat-docent; in 1812 he was appointed there extraordinary professor of theology; and in the following year was called to the newly established university of Berlin as professor of church history. Here he labored till his death, July 14, 1850. Neander enjoyed immense celebrity as a lecturer. Students flocked to him not only from all parts of Germany, but from the most distant Protestant countries. Many Roman Catholics, even, were among his auditors, and it is said that there is hardly a great preacher in Germany who is not more or less penetrated with his ideas. His character, religiously considered, is of so noble a Christian type that it calls for special notice. Ardently and profoundly devotional, sympathetic, glad-hearted, profusely benevolent, and without a shadow of selfishness resting on his soul, he inspired universal reverence, and was himself, by the mild and attractive sanctity of his life, a more powerful argument on behalf of Christianity than even his writings themselves. Perhaps no professor was ever so much loved by his students as Neander. He used to give the poorer ones tickets to his lectures, and to supply them with clothes and money. The greater portion of what he made by his books, he bestowed upon missionary, Bible, and other societies, and upon hospitals. As a Christian scholar and thinker, he ranks among the first names in modern times, and is believed to have contributed more than any other single individual to the overthrow, on the one side, of that anti-historical rationalism, and on the other of that dead Lutheran formalism, from both of which the religious life of Germany had so long suffered. To the delineation of the development of historical Christianity, he brings one of the broadest, one of the most sagacious (in regard to religious matters), one of the most impartial yet generous and sympathetic intellects. His conception of church history as the record and portraiture of all forms of Christian thought and life, and the skill with which, by means of his sympathy with all of these, and his extraordinary erudition, he elicits, in his *Kirchengeschichte*, the varied phenomena of a strictly Christian nature, have placed him far above any of his predecessors. Neander's works, in the order of time, are: *Ueber den Kaiser Julianus und sein Zeitalter* (Leip. 1812); *Der Heil. Bernhard, und sein Zeitalter* (Berl. 1813); *Genetische Entwickelung der vornehmsten Gnostischen Systeme* (Berl. 1818); *Der Heil. Crysostomus und die Kirche besonders des Orients, in dessen Zeitalter* (2 vols. Berl. 1821–22; 3d ed. 1849); *Denkwürdigkeiten aus der Geschichte des Christenthums und des Christlichen Lebens* (3 vols. Berl. 1822; 3d ed. 1845–46); *Antignosticus, Geist des Tertullianus und Einleitung in dessen Schriften* (Berl. 1826); *Allgemeine Geschichte der Christlichen Religion und Kirche* (6 vols. Hamb. 1825–52); *Geschichte der Pflanzung und Leitung der Kirche durch die Apostel* (2 vols. Hamb. 1832–33; 4th ed. 1847); *Das Leben Jesu Christi in seinem geschichtlichen Zusammenhange*, written as a reply to Strauss's work (Hamb. 1837; 5th ed. 1853); *Wissenschaftliche Abhandlungen*, published by Jacobi (Berl. 1851); *Geschichte der Christlichen Dogmen*, also published by Jacobi (1856). The majority of these works, including the most important, have been translated into English, and form more than a dozen volumes of Bohn's "Standard Library."

NEAP-TIDES. See TIDES.

NEAR'CHUS, the commander of the fleet of Alexander the Great in his Indian expedition, 327–26 B.C., was the son of one Androtimus, and was born in Crete, but settled in Amphipolis. In 329 B.C. he joined Alexander in Bactria, with a body of Greek mercenaries, and when the latter ordered a fleet to be built on the Hydaspes, Nearchus received the command of it. He conducted it from the mouth of the Indus to the Persian gulf, in spite of great obstacles, resulting partly from the weather and partly from the mutinous disposition of his crews. Nearchus left the Indus on Sept 21, 325, and arrived at Susa, in Persia, in February 324, shortly after Alexander himself, who had marched overland. Fragments of his own narrative of his voyage have been preserved in the *Indica* of Arrian.—See Dr. Vincent's *Commerce and Navigation of the Ancients in the Indian Seas* (vol. i. pp. 68–77, Lond. 1807), and Geier's *Alexandri Magni Historiarum Scriptores* (pp. 108–150).

NEATH, a parliamentary and municipal borough and river-port of the co. of Glamorgan, South Wales, on a navigable river of the same name, seven m. n.e. of Swansea. It is built on the site of the Roman station *Nidum*, and it contains the remains of an ancient castle, burned in 1231. In the immediate vicinity are the imposing ruins of Neath abbey, described by Leland as "the fairest abbey in all Wales," but now sadly decayed and begrimed by the smoke and coal-dust of the public works of the district. There are at Neath several extensive copper and tin works. Copper, spelter, iron and tin plates, and fine bricks are extensively exported, stones are quarried, and coal and culm are raised. The trade of the port has largely increased within late years. Pop. '71, 10,060.

NEB-NEB, or NIB-NIB, the dried pods of *Acacia Nilotica*, one of the species of Acacia (q.v.) which yield gum-arabic, and a native of Africa. These pods are much used in Egypt for tanning, and have been imported into Britain.

NEBO, the name of a well-known deity of the Babylonians and Assyrians. He presided over learning and letters. He is called the "far-hearing," "he who possesses intelligence," "he who teaches or instructs." He generally has the distinguished titles of "Lord of lords," "Holder of the scepter of power," etc. Hence Layard thinks the name is derived from the Egyptian *Neb*, Lord, The wedge or arrow-head—the essential element of cuneiform writing—was his emblem. His character corresponds with that of the Egyptian Thoth, the Greek Hermes, and the Latin Mercury. A statue of Nebo was set up by Pul, the Assyrian monarch, at Calah (Nimrud), which is now in the British museum. Nebo early held a prominent place in Babylonia, and from a remote age a great temple was dedicated to him at Borsippa, the modern *Birs Nimrud*, and that ancient town was especially under his protection. He was the tutelar god of the most distinguished Babylonian kings, of whose names the word Nebo or *Nabu* forms a part, as *Nebu*-chadnezzar, *Nebu*-zaradan, and some mentioned in classical writers, as *Nebo*-nedus, *Nabo*-nassur, *Nabo*-polassar. Astronomically, Nebo is identified with the planet nearest the sun. Nebuchadnezzar rebuilt his temple at Borsippa, where his worship was continued to the 3d or 4th c. after Christ.

NEBRASKA, or PLATTE, a river of Nebraska, rises in the Rocky mountains, lat. 42° 30′ n., long. 109° w., and flowing easterly 600 m. through the entire territory, watering its great valley, falls into the Missouri.

NEBRASKA, one of the United States of America, lying in lat. 40° to 43° n., and long. 95° to 104° w.; bounded on the w. by Wyoming, and n. by Dakota, being partly separated from the latter by the Missouri river and its branch the Niobrara; e. by Iowa and Missouri, from which it is separated by the Missouri river; s. by Kansas and Colorado. This state is about 425 m. from east to west, and from 138 to 208 from north to south, and has an area estimated at 75,995 sq. miles. Originally, when this state was a territory, it extended from the Missouri river to the Rocky mountains, and from lat. 40° to the boundary of what was, at the time, British America. The chief towns are Omaha city, the starting point of the Union Pacific railway, Nebraska City, and Lincoln, the capital. Nebraska is a vast plain rising gradually towards the Rocky mountains, with immense prairies, the haunts of vast herds of buffalo, and with fertile and well-timbered river-bottoms. The chief rivers are the Missouri on its eastern, and the Niobrara, partly on the northern boundary, the Platte or Nebraska, and the Republican fork of the Kansas, and their branches. The Platte valley, running through the whole center of the territory, is broad and fertile. There are quarries of sandstone, a soft limestone which hardens on exposure, and thin beds of coal. In the mountainous western region are mines of gold, silver, copper, and cinnabar. Between the fertile lands of the eastern and central portion and the mountains is a great desert valley of 30 by 90 m., 300 ft. deep, full of rocky pinnacles, and rich in fossil remains. The climate is dry and salubrious, with an abundance of clear sunny days. The country produces wheat, maize, hemp, tobacco, and fruits in abundance, while the rolling prairies afford unequaled pasturage. The Omahas, Pawnees, Otoes, Sioux, and other wild tribes hunt over the unoccupied territories, but the immigration is progressing rapidly. Erected as a territory in 1854, it had, in 1860, a population, exclusive of Indians, of 28,836; and in 1870, with the same exclusion, it was 122,117. Nebraska became a state in 1867. See *Nebraska*, by Edwin A. Curley (Lond. 1875).

NEBRAS'KA (*ante*), was originally a portion of the Louisiana territory ceded to the United States by France in 1803, and it formed successively a part of the Louisiana and Missouri territories until 1854. During the winter of that year Stephen A. Douglas succeeded, amid much political excitement, in having congress pass what was widely known as his Kansas-Nebraska bill, which resulted in the establishment of Nebraska as a territory. It included a part of Dakota, Montana, Wyoming, and the n.e. portion of Colorado at that time; but in 1861 and 1863 it was reduced to its present limits. Up to the summer of 1854 it had had no civilized residents except the soldiers sent to keep the Indian tribes in order, the missionaries, and the fur traders; and until the construction of the Pacific railroad the population increased very slowly. The principal growth has been since its admission to the union as a state, and during the past ten years it increased at a rapid rate. The pop. in '80, was 452,432—355,042 of American birth; 2,627 colored. Nebraska has also within the past few years begun to take a prominent place as an agricultural and stock-raising state. The soil in the eastern part of the state is deep and fertile, and the whole region s. of the Platte river and e. of the 99th meridian is a rich black vegetable mold from two to ten ft. deep, slightly impregnated with lime, free from stones or gravel, and easily plowed to any depth required. The agricultural region embraces about 30,000 sq.m., extending 150 m. w. of the Missouri, and in the valley of the Platte 300 miles. Wheat, corn, barley, oats, sorghum, flax, hemp, and all vegetables may be raised; and below lat. 42° the common small fruits grow in abundance. The grazing regions comprise about 23,000,000 acres, and is generally well watered. The wild grasses, of which 150 species have been classified, yield on the bottom and table lands from 1¼ to 3 tons an acre and are very nutritious. Large numbers of cattle are brought from Texas and Kansas to be fattened on the grasses of Nebraska preparatory to sale; and the cattle drives which pass through the state are a growing source of material prosperity. The drive of 1879 from Texas and the south-western ranges is reckoned at 250,000 head, and that from Montana and Oregon at 100,000. Formerly Kansas was the northern limit of the drive; but the great rendezvous of cattle drovers, which used to be at Abilene on the Kansas Pacific road, is now to be found at Ogallala on the Union Pacific road in Nebraska, which point, it is believed, will soon become the greatest stock thoroughfare on the continent. Up to June, 1873, about 29.651,200 acres had been surveyed, and the number of acres of improved farm land in 1870 was nearly 700,000; number of farms, 12,301, of which 787 contained less than 10 acres each, 1,541 from 10 to 20, 5,096 from 20 to 50, 3.879, from 50 to 100, 1,487 from 100 to 500, and 11 from 500 to 1000. Their cash value was estimated to be $30.242,186; and the value of the farming implements and machinery to be $1,549,716. The estimated value of all farm productions was $8,604,742. Chief among these productions were: spring wheat, 2,109,821 bush.; winter wheat, 15,765 bush.; rye, 18,532; Indian corn, 4,736,710; oats, 1,477,562; barley, 216,481; buckwheat, 3,471; peas and beans, 3,332; Irish potatoes, 739,984; sweet potatoes, 762; grass seed, 133; flax seed, 404; tobacco, 5,988 lbs.; wool, 74,655; butter, 1,539,535; cheese, 46,142; hops, 100; honey, 28,114; sorghum molasses, 77,598 galls.; wine, 470; hay, 169,354 tons. Of the live stock, there were 30,511 horses; 2,632 mules and asses; 28,940 milch cows; 5,931 working oxen; 45,057 other cattle; 22,725 sheep; and 59,449 swine. The greatest obstacle that the farmers have to contend against is the visitations of grasshoppers or locusts, and Nebraska seems to be more subject to devastations of this kind than most of the other western states. Active measures, however, have been taken to exterminate these insects, the legislature in 1879 having authorized road supervisors throughout the state to order out all voters in their respective precincts to do twelve days' work each in killing grasshoppers, for which each person will be paid $2 a day in county warrants. The climate is mild and dry, but drought rarely damages the crops, for the soil is such that it withstands extreme and prolonged heat. The mean temperature during the winter months ranges from 22° to 30°; that of the spring from 47° to 49°; of the summer from 70° to 74°; and of the autumn from 49° to 51°. The heat of the summer is tempered by the prairie winds, and the nights are usually cool. The greatest amount of rain falls in May and June. A weather-record, kept from 1868 to '69 at Nebraska City, gives the mean annual rainfall as 30.36 in., of which 20.87 in. fell between the first of April and the first of October, and only 9.49 in. between these dates reversed.

Metals and minerals have not yet been found to any extent in Nebraska. Coal has been discovered here and there, ranging in layers from 5 to 22 in., but it has not so far yielded sufficient quantities for the home demand. Prof. Hayden believes that this deposit is the western margin of the great coal-basin of Missouri and Iowa, and that the coal is so much thinned out by pressure from above that it will not prove profitable to mine to any extent. Building-limestone has also been discovered, and is in daily use for the erection of dwellings, together with a dark, yellowish, gray sandstone, and a dark freestone. Clay, for the manufacture of brick, is easily obtained, and in the central and western parts of the state there are numerous salt-basins, yielding 16 per cent of salt, which is declared to be the purest and best in the world. Smelting works have been in successful operation at Omaha since 1871, and in the year 1873 they turned out in fine silver and gold about $1,100,000, and during the following year they refined and separated 7,000 tons of base bullion, and smelted 2,000 tons of ore. The value of the gold and silver produced was $1,350,000; the quantity of lead shipped 6,500 tons, valued at $800,000, making a total of the value of products of this establishment $2,135,000. Though the manufacturing industry of the state is in its infancy, there are already car-works, foundries, distilleries, gas-works, breweries, flouring mills, broom factories, pork packeries, soap-works, pickle factories, carriage, wagon, and implement factories in prosperous existence. Altogether there were, in 1870, 670 manufacturing establishments, employing 2,665 operatives and $2,169,963 capital, using $2,902,074 of raw material, and producing annually goods valued at $5,738,512. For the year 1875 this amount is reported to have been about three times larger, and nearly every industry since has continued to give promise of much prosperity.

Nebraska necessarily has only a domestic commerce. Except that portion of the state's productions and manufactures that are shipped on the Missouri river, all are transported over the railroads. The actual amount of this trade has never yet been accurately estimated, but in 1874 more than 1,500,000 bushels of grain were sent to the market by a single railroad, from which an idea at least may be formed of the magnitude of the state's relations to the general commerce of the country. In 1874 there were 10 national banks in operation in the state, with a paid-in capital of $1,025,000 and an outstanding circulation of $895,900; 7 state banks, with an aggregate capital of $575,000; 1 savings bank; and 22 private banking-houses. The number of railroads in operation was 10, with 1120 m. of track. These were the Atchison and Nebraska, the Brownville and Fort Kearney, the Burlington and Missouri River, the Omaha and Southwestern, the Midland Pacific, the Omaha and Northwestern, the St. Joseph and Denver City, the Sioux City and Pacific, the Tremont, Elkhorn, and Missouri Valley, and the Union Pacific. The assessed value of these roads at that date was $11,183,114; and their cost and equipment, according to the reports of the various companies, was $53,727,833. The Union Pacific traverses the entire state from e. to w.; the Burlington and Missouri has direct through-connection between Kearney, in central Nebraska, and Chicago; the Midland Pacific places the eastern part of the state in communication with St. Louis; and the St. Joseph and Denver in the s., the Omaha and Northwestern in the n., together with connecting roads to the eastward and elsewhere, afford Nebraska excellent facilities for moving her produce and for carriage traffic generally.

In 1878 the state had no indebtedness except $50,000, in 10 per cent 10-year bonds, issued for the relief of grasshopper sufferers in 1875, and $549,267.35 in 8 per cent funding bonds, issued April, 1877, providing for the outstanding warrants and other indebtedness, making a total of $599,267.35. The assessed value of all taxable property during the year 1879 was $74,389,535.97, an increase of $3,077,957.07 over the previous year. The rate of taxation was 6.37 mills on each dollar, and the amount collected for the fiscal period of two years was as follows: General fund, $517,977.82; sinking fund, $120,-240.58; common school fund, $145,333.27; university fund, $40,314.39. The disbursements for all purposes during the same period were $1,772,209.99; and there was a balance in the treasury in Nov., 1878, of $460,181.09. The total valuation of the state, as reported by the state board of equalization in 1874, was $81,218,818. The lands held by private owners and subject to taxation amounted to 11,000,579 acres, the assessed value being $43,004,800; town lots, $9,941,809; money used in merchandise, $2,448,235; in manufactures, $522,410; stocks and shares, $979,455; moneys and credits, $1,578,329; household furniture, $343,762. The horses, cattle, and other live-stock were valued at $77,081,044. The railroad property was valued at $11,183,114; and the telegraph, of which the Western Union company owned 737 m., and the Great Western company 126 m., at $61,555. The property of corporations is taxed in the same manner as that of individuals.

The educational interests of the state have been for many years watchfully managed. The school lands donated by the government comprise about 2,700,000 acres for schools in general, and 400,000 acres for the erection and maintenance of a state university at Lincoln. Out of the sale and lease of these lands and a general tax of two mills, together with the money received from fines, licenses, and a dog tax, the schools are supported, the apportionment being made by a state superintendent among the counties according to the number of children between the ages of 5 and 20 years. In 1874 there were 2,215 school districts, containing 72,991 children, of whom 47,718 attended school. The total number of school buildings was 1516, of which 1345 were stone, brick, or frame, and 171 log, sod, or dug-outs. Their value was estimated at about $1,546,480. The number of male teachers employed was 1252; of female, 1483. The average monthly wages of the first was $37.98; of the second, $32.12. The total receipts for school purposes from all sources were $988,740.20; and the total expenditures, $1,004,957.03. There are graded schools in 12 towns, and high schools in every town. At Peru there is also a state normal school, with 10 instructors, which has an average attendance of about 200 pupils. The state university was first opened in 1871, and comprises 6 departments: (1) a college of ancient and modern languages, mathematics, and natural science; (2) agriculture; (3) law; (4) medicine; (5) practical science, mechanics, and civil engineering; (6) fine arts. The number of its professors in 1874 was 8, and the number of students in attendance was 114. Besides these institutions there are two colleges under denominational control, Nebraska college (Protestant Episcopal), at Nebraska City, and Doane college (Congregational), at Crete. The former was chartered in 1868, has 10 professors, and grounds and buildings valued at $23,000; the latter was organized in 1873, has 4 professors, and ground and buildings worth $50,000. Of the libraries throughout the state, the census of 1870 reported 390, containing 147,040 volumes, of which 219, with about 95,000 volumes, were private, and 171, with 51,955 volumes, were public. The number of newspapers and periodicals published in 1880 was about 77. Of these 10 were dailies, 62 weeklies, 1 semi-monthly, and 4 monthlies. The total number of church organizations in 1874 was 514; church edifices, 279; church property, $665,150. The leading denominations were: Baptist, 90; Disciples, 15; Congregational, 65; Protestant Episcopal, 26; Evangelical Association, 10; Lutheran, 30; Methodist, 94; Presbyterian, 78; Roman Catholic, 18; Unitarian, 3; United Brethren in Christ, 84; Universalist, 1.

The constitution of Nebraska provides that every male person of the age of 21 years and upwards, who is a citizen of the United States or has declared his intention 30 days previous to an election to become a citizen, and who is neither insane, an idiot, nor an unpardoned felon, shall be entitled to vote, provided he has resided in the state six months. The executive department consists of a governor, lieutenant-governor, secretary of state, auditor of public accounts, treasurer, superintendent of public instruction, and commissioner of public lands and buildings, who are elected every two years. In 1880 the house of representatives consisted of 84 members, and the senate of 30. The judicial power is vested in a supreme court of three judges, elected for six years; six district courts, with one judge for each, elected for four years; and county courts, each presided over by one judge, whose term of office is two years. Justices of the peace and police magistrates are appointed to try minor cases. Under the apportionment of 1872 the state is entitled to only one representative in congress. Its electoral votes have been cast as follows: 1868, Grant and Colfax, 3; 1872, Grant and Wilson, 3; 1876, Hayes and Wheeler, 3; 1880, Garfield and Arthur, 3.

NEBRASKA CITY, the co. seat of Otoe co., Neb., on the w. bank of the Missouri river, 44 m. s. of Omaha, on the Nebraska railroad; pop.'70, 6,050. It has a courthouse, churches, schools, banks, 2 daily and 3 weekly newspapers, the academy of the Annunciation, under Catholic control, and Nebraska college, under Episcopal control. There are flour mills, breweries, machine shops, foundries, etc.

NEBUCHADNEZ'ZAR. See BABYLON.

NEBULÆ, a name given to indistinct patches of light in the heavens, supposed to proceed from aggregations of rarely distributed matter belonging to distant worlds in the course of formation. By the gradual improvement of telescopes in power and distinctness, these nebulæ have, one after another, become resolved into clusters of distinct stars, and it is now generally supposed that such a resolution of all nebulæ which have been observed is only limited by the power of the telescope. It is probable that the group of stars with which our system is immediately surrounded, and which forms to our eyes the galaxy which studs the firmament, would, if looked upon from the immeasurable distances at which the so-called nebulæ are situated, itself assume the appearance of such a nebula; and that in the intervals there exist spaces as void of starry worlds as these are comparatively full of them. See STARS. Some nebulæ are of a round form presenting a gradual condensation towards the center; others consist of one star surrounded by a nebulous haze; while a third class present just the same appearance as would be exhibited by the solar system, if seen from a point immensely distant. These and other phenomena suggested to Laplace the idea, afterwards developed into a theory, and known as the *nebular hypothesis*, that these nebulæ were systems in process of formation; the first stage presenting an agglomeration of nebulous matter of uniform density, which, in the second stage, showed a tendency to gradual condensation towards the center; and, finally, the nebulous matter round the now-formed center of the system, separated itself into distinct portions, each portion becoming condensed into a planet. The same opinion regarding the formation of planets from nebulæ was put forward by sir William Herschel in 1811; but the subsequent discoveries made by lord Rosse, were supposed to expose a fallacy in this theory. That wonderful instrument, the spectroscope, has, however, recently reinstated the nebular theory, by showing that among these appearances there are real nebulæ devoid of solid or liquid matter, and consisting of masses of glowing gas—apparently nitrogen and hydrogen.

NEBULÆ (*ante*). The earliest mention of nebulæ is that of the Arabian astronomer Sufi, who, in the 10th c. described the Magellanic clouds and the nebula in Andromeda. Ptolemy had made a catalogue of "cloudy stars," but the objects he mentioned are easily resolvable into star clusters with small telescopes. The nebula in Andromeda, which is visible to the naked eye, was the only one discovered before the invention of the telescope, although a few others are now known which are faintly visible. In 1656 Huyghens discovered the great nebula in the constellation Orion, publishing an account of it along with the discovery of the rings of Saturn in 1659. In 1714 Halley described six nebulæ. In 1755 La Caille sent a list of 42 nebulæ which he had discovered at the cape of Good Hope, to the academy of sciences at Paris. Messiers published a list in 1783 and 1784, containing an account of 103 nebulæ, the greatest number described by one observer before the observations of sir William Herschel, who, in 1781, with a five-foot reflector of his own construction began his investigation of the heavens, his first performance being the discovery of Uranus. By the use of this and other telescopes he was enabled in 1786 to communicate to the royal society a catalogue of 1000 new nebulæ and clusters; in 1787 a second catalogue of another 1000, and in 1802 a third, containing 500 more. Sir John Herschel, between 1825 and 1830 reviewed a portion of his father's work, adding a list of 500 nebulæ and clusters of his own discovery, making in all a list of 2,306 nebulæ and clusters in the northern hemisphere, which he sent to the royal society. In 1833 he took his instruments to the cape of Good Hope, the result of which was a catalogue of 1708 nebulæ and clusters in the southern heavens. The whole number of nebulæ and clusters now known is over 5,000. The most complete catalogue is that of sir John Herschel, published in 1864, which contains all that were accessible to him up to 1863. The number there recorded is 5,079. The *nebulæ* have presented a subject about which there has always been doubt, in regard to their position as well as constitution. After many of them had been resolved into starry clusters it was thought they were all galaxies similar to our own solar system, and sir William Herschel adopted this view in regard to certain nebulæ which he supposed were external to our stellar system, but afterwards in developing his nebular hypothesis, he found it difficult to distinguish between the external nebulæ and those which are generally thought to be parts of our own sidereal system. Proctor expresses the opinion "that our sidereal system extends far beyond the limits which have ordinarily been assigned to it, and that there are no nebulæ which can be regarded as external to it." Herschel concluded that there were nebulæ which are not resolvable into stars, and that they consisted of gaseous matter. The forms of nebulæ are various, and they change in appearance with different powers of the telescope. The spiral nebulæ, which were first made known by lord Rosse are examples of this kind, their spiral form having previously not been suspected. Some planetary nebulæ resemble planets, and when viewed with telescopes of high power present a complicated appearance. Some have the appearance of a ring and are called annular nebulæ; there is a beautiful example in the constellation Lyra in which a central mass is surrounded by a ring. Some are in pairs, like double stars. Small nebulæ generally have the appearance of a bright nucleus surrounded by a veil; some of them are called stellar nebulæ. Others are very irregular, and have long filmy arms. Those in Orion and Andromeda are examples, as also the great nebula in Argo which was carefully described by sir John Herschel in his Cape observations. Those nebulæ which are resolvable into stars give spectra which resemble the spectra of stars, while those which are obtained from the light of unresolvable nebulæ give a spectrum of three, sometimes four, bright lines, one of which corresponds to a line in the spectrum of hydrogen, and another to a line in that of nitrogen. The planetary nebulæ also give similar gaseous spectra. Of 70 nebulæ examined by Huggins about one-third gave gaseous spectra. The nebular hypothesis in regard to the formation of the universe, although previously proposed by Swedenborg, Buffon, and Kant, was first systematized by Herschel and Laplace, and has been since modified. Laplace's earlier ideas were embraced in a consideration as to the manner of the formation of our solar system. He conceived that a mass of highly-heated vaporous matter occupied a space larger than the orbit of the farthest planet. In consequence of molecular and gravitating forces it acquired rotation, by which it threw off rings of matter which afterwards broke up into planets and their satellites. Herschel's theory caused a modification of Laplace's who adopted the idea that primordial nebulous matter still existed which was being formed into nebulæ and clusters. The general idea now entertained is that this primordial matter has accomplished the work of world formation by the action of gravity aided by molecular forces. It is assumed by some that on physical principles primordial matter widely distributed through space would pass through the following changes. Gravitation would cause the mass to contract, and become more dense; this would be followed by atomic repulsion, which acting against gravitation would produce heat. After a certain degree of condensation had taken place molecular combination would result, which would again cause a great evolution of heat; this would be followed by radiation and precipitation of binary atoms as flocculi floating in the rarer medium: these flocculi will tend to move toward a common center, but as the mass is irregular the motion will really be to one side of the center. This will result in a spiral movement. Mutual attraction will produce groups of flocculi, moving around local centers of gravity. There will be here and there detached portions which will not coalesce with the larger internal masses, but will slowly follow without overtaking them, thus accounting for the formation of comets. Many dynamic principles are involved in such motions and changes of matter which have received the attention of scientists, of which may be mentioned the investigation of molecular vortices by Rankine, and of vortex rings by Helmholtz and Thomson, and the preservation and disruption of revolving rings by Maxwell, Peirce, and Hind in memoirs on the rings of Saturn, that although grand and instructive views have been obtained of the regions of space, the brilliant investigations of science have as yet afforded no positive knowledge of its infinite depths, or of its genesis.

NE'BULY, one of the partition lines in heraldry, which runs out and in in a form supposed to represent the uneven edges of clouds.

NECESSITY. This word occurs in connection with two different philosophical subjects, namely, the freedom of the will (see FREE-WILL), and the nature of our belief in fundamental truths, such as the axioms of mathematics. It is alleged by some philosophers that the truths held by us as most certain are the result of experience, and that the degree of certainty is but a measure of the universality of the experience. Others contend that such first principles as the axioms of mathematics are not only true, but *necessarily* true. Such necessity, it is argued, cannot come from mere experience, and therefore implies an innate or intuitive source. Hence the theory of necessary truth is only another name for the theory of instinctive or intuitive truth.

Necessity is a word too vague in its signification to serve as a leading term in philosophy. There are several meanings attaching to it which should be clearly set forth before entering on the discussion of such questions as those above mentioned.

1. Necessity, in the first place, means that one fact or statement is *implied* in another Thus, if we say that all the apostles were Jews, it follows necessarily that Peter was a Jew; this is not a new fact, but merely a reassertion of a portion of the same fact. We are not at liberty to affirm a thing in one form, and then deny the same thing when expressed in a different form. If we say this room is hot, it is repeating the assertion in another way, to say that it is not cold. These truths follow by necessary inference. Hence the general axiom of the syllogism, that what is true of a whole class must be true of each individual, is a necessary truth in this sense. In affirming such a truth, we merely declare that we shall be consistent, and that when we have affirmed a proposition in company with other propositions, we are prepared to affirm it when taken apart from the others This kind of necessity is sometimes called logical necessity, and sometimes

mathematical necessity. We might call it deductive necessity, or necessity by implication.

2. A second meaning is inductive certainty; or the certainty that arises from a well grounded experience. That lead will sink in water; that animals need food and air in order to live; that warmth promotes vegetation,—are truths that we call necessary, in the sense of being so certain that we may always count upon them. We presume with the highest confidence, that an unsupported body will fall to the ground, not because the fact of falling is implied in the fact of matter, but because nature has uniformly conjoined the two facts. We can speak even of moral necessity; by which we mean only uniform sequence and consequent certainty. When we declare that children, whose education has been neglected, must fall into evil courses, we declare what experience has shown us will happen in relation to the human mind.

3. When necessity means neither deductive implication, nor inductive certainty, it refers us to a peculiar test supposed to apply to the truths in dispute—namely, the inconceivableness of their opposite. It is said that, not only can we not *believe* in the opposite of the axiom, that "the sums of equals are equal," but we cannot even *conceive*, imagine, or picture to ourselves the opposite of it. This impossibility of conceiving the contradiction of any statement, is regarded by many as a peculiarly cogent circumstance in its favor. It distinguishes the axiomatic first principles from the truths of inductive science, these having, it is said, an inferior order of certainty. To this it may be replied, however, that men's power of conceiving is so much affected by their education and habits, that many things, whose opposites were at one time inconceivable, have since been found to be false. For example, the notion that men could live at the antipodes was once reckoned inconceivable, and we now know it to be a fact. An unvarying association will often produce a disability to conceive anything different.

In commencing a discussion as to the necessary character of any truth, the disputants should agree beforehand which of the three meanings they intend. In the controversy on the mathematical axioms, maintained between Dr. Whewell on the one hand, and sir John Herschel and Mr. J. S. Mill on the other, the third meaning is more particularly involved. The doctrine of inconceivability, as the test of truth, has been put forward by Mr. Herbert Spencer, under the title of the universal postulate (*Principles of Psychology*, Part I).

NECHES, a river of Texas, rises in the central eastern portion of the state, and flows s. by e., 200 m., into Sabine bay, where its waters, with those of the Sabine river, find their way, by Sabine pass, into the gulf of Mexico.

NECHO, PHARAOH NECHO, or NEKU, an Egyptian king, son and successor, according to Herodotus, of Psammeticus, and contemporary of Josiah king of Judah. Sacred and profane writers relate his successful wars in Syria. Soon after his accession to the throne he prepared large fleets on the Mediterranean and Red seas, and sent some expert Phenician sailors to explore the coasts of Africa. They are said to have circumnavigated Africa, by which its peninsular form was ascertained, more than 2,000 years before Vasco de Gama doubled the cape of Good Hope. He attempted also to reopen the canal connecting the Red sea with the Nile. To check the power of the Assyrians, he collected a large army at the beginning of his reign, B.C. 610, and entered Palestine with the view of besieging Carchemish on the Euphrates. But Josiah resented his passage through his territory, and, though Necho sent messengers disclaiming any hostile designs, Josiah encountered him in the plain of Megiddo, about 40 m. n. of Jerusalem. Josiah's forces were routed with great slaughter. He himself was wounded with an arrow, and his attendants, removing him from his chariot, conveyed him to Jerusalem, where he died. Necho proceeded on his march to the Euphrates. Three months after the capture of Carchemish and the defeat of the Chaldeans, he learned that Jehoahaz, a younger son of Josiah, had usurped the throne of his father. Necho deposed him, condemned the land to a yearly tribute, and carried him prisoner to Jerusalem. He then made Eliakim king, changing his name to Jehoiakim, took the silver and gold which had been levied from the Jewish nation, and returned to Egypt with Jehoahaz. Four years afterwards he again marched into Syria against the Babylonians, but Nebuchadnezzar completely routed his army, and, advancing through Palestine, took from Necho all the Egyptian possessions from the Euphrates to the southern extremity of Syria. Nebuchadnezzar deposed Jehoiachin, who had succeeded his father, and carried the warriors and treasures to Babylon. Necho died soon after, having reigned, according to Herodotus, 16 years. He was of the Saïte 26th dynasty, of which Manetho makes him either the fifth ruler or the sixth. Herodotus calls him Nechôs. He was succeeded by Psammeticus II.

NECKAR, one of the largest tributaries of the Rhine, and the principal river of Würtemberg, rises near to the source of the Danube, on the eastern declivity of the Black forest, and close to the village of Schweningen. It has a winding course of 240 m., first n.e. to its junction with the Fils, then n. to its junction with the Jaxt, and finally n.w. to Mannheim, where it joins the Rhine. The principal places on its banks are Tübingen, Heilbronn, Heidelberg, and Mannheim. Its course, leading first through a deep and narrow dale, leads afterwards through a succession of wide and fertile tracts, inclosed by soft vine-clad hills. The scenery of its banks is, in general, very beautiful, and in many places highly romantic. From Cannstadt, about midway in its course, the Neckar is navigable; steamers ply regularly to Heidelberg. Good wines are grown on its banks. Chief affluents, on the left, the Enz; on the right, the Fils Rems, the Kocher, and the Jaxt.

NECKER, Jacques, a famous financier and minister of France, was b. Sept. 30, 1732, at Geneva, where his father, a native of Brandenburg, but of Anglo-Irish descent, was professor of German law. He became a banker in Paris and acquired a large fortune during the seven years' war. After retiring from business he became the representative of his native city at the French court; and also acquired a high but not exactly a solid reputation by his publications on political economy and finance, particularly his *Essai sur la Législation et le Commerce de Grains* (Par. 1775). In this essay he appears as the opponent of the wise Turgot's liberal measures in regard to the traffic in grain, and claims for the state the right of fixing its price, and if it thinks it necessary, of prohibiting its exportation. On the removal of Turgot from office in June, 1776, Necker was called to assist in financial affairs, and after the brief administration of Clugny he was made general director of finances in June, 1777. Necker could not conceal his elation. This was his weak point. He had all the vanity, egotism, and love of show that marked his brilliant but superficial daughter. Nevertheless he succeeded not only in meeting the exigences of the American war, but in restoring to some degree of order the general financial affairs of the country, though mainly by the perilous expedient of borrowing, which he was enabled to do to an almost unlimited extent, owing to the confidence reposed in his financial dexterity. Some years he borrowed as much as 490,000,000 of francs. His Protestantism, however, and some retrenchments which he made in the royal household, with his publication on the financial affairs of France (*Compte Rendu*, which produced an immense sensation), made him an object of great dislike to the queen and court, and on May 12, 1781, he was suddenly dismissed. He retired to Geneva, where he was visited, from motives of sympathy and respect, by the highest personages in the realm, the prince of Condé, the dukes of Orleans and Chartres, the prince of Beauvau, the duke of Luxembourg, maréchal de Richelieu, the archbishop of Paris, etc., but returned to Paris in 1787, from which he was soon banished on account of an attack which he published on the financial management of the reckless and ignorant Calonne. In the financial and political crisis, however, which followed upon the financial administration of Loménie de Brienne, Louis XVI. found himself under the necessity of calling Necker in Nov., 1788, to the office of comptroller-general of finances and minister of state. Necker recommended the calling of the states-general, and thereby acquired the greatest popularity. He failed, however, in the difficulties which ensued, having no capacity for political affairs in other than their mere financial aspects. When the court, on June 23, 1789, determined upon nullifying the resolution of the third estate, Necker hesitated, and the king therefore dismissed him on July 11, and required him to leave the French dominions immediately. He obeyed, but the disturbances of July 12, 13, and 14 (on the last of which days the Bastille was taken) were the result of his dismissal, and the king was under the necessity of recalling him. He now allied himself with Mounier and other ministers for the introduction of a constitution like that of Britain, with two chambers or houses of parliament; but this caused a great diminution of his popularity, and he was unable to contend in debate with Mirabeau and other great leaders of the national assembly. On the rejection by the assembly of his scheme of a loan, and the adoption instead of it of Mirabeau's scheme of assignats, he resigned his office in Sept., 1790, and retired to his estate of Coppet, near Geneva, where he died, April 9, 1804. Besides the works already mentioned he published several on political and on religious subjects, particularly a work on the French revolution (4 vols. Par. 1796), which has been frequently reprinted. His daughter was the celebrated madame de Staël.

NECKER, Susanne Curchod de Nasse, 1739–94; b. canton Bern, Switzerland. Her father, the pastor of Nyon, gave her an excellent education, but opposed her union with Gibbon, the historian, with whom she was intimate. In 1764 she was married to Jacques Necker, the finance minister of Louis XVI. Her house in Paris became the resort of Buffon, Diderot, D'Alembert, and most of the celebrities of the time, whose influence she used to further her husband's political advancement. Her principal literary works are *Réflexions sur le Divorce; Mémoire sur l'Etablissement des Hospices*, a treatise upon hasty interments, and five volumes of miscellanies, published by her husband after her death. She founded a hospital in Paris which bears her name. Her life was written in 1820 by Auguste de Staël-Holstein.

NECK-MOLDING. A molding at the junction of the capital and shaft of a column. The plain space between the astragal of the shaft and the moldings of the cap of the Roman Doric order is called the *neck*.

NECROMANCY (Gr. *nekros*, dead, and *manteia*, divination), a mode of divination by the conjuring up of the dead to question them concerning the future. It originated in the east, and in times of the most remote antiquity. It is condemned in the Old Testament; and the story of the witch of Endor affords a remarkable illustration of it, which has not a little perplexed interpreters of Scripture. The eleventh book of Homer's *Odyssey* bears the title of *Νεκρομαντεια*, and in it the shade of Tiresias is represented as brought up and consulted by Ulysses. In most parts of Greece necromancy was practiced by priests or consecrated persons in the temples; in Thessaly it was the profession of a distinct class of persons called psychagogoi ("evokers of spirits"). The practice of it in that country was ultimately connected with many horrid rites, in which human blood, half-burned portions of bodies from funeral piles, the immature fetus cut out of the womb, etc., were employed, and sometimes human beings were slain that their spirits might be consulted ere they finally passed into the lower world. The establishment of Christianity under Constantine caused necromancy to be placed under the ban of the church. There are evident traces of necromancy in some of the older Norse and Teutonic poems. The mediæval belief in the evocation of spirits belongs rather to sorcery than to necromancy. See Peucer's *Commentarius de Præcipuis Divinationum Generibus* (Zerbst, 1591).

NECROMANCY (*ante*). See SPIRITUALISM, *ante*.

NECROPHILISM, an unnatural and revolting love or appetite for the dead which has manifested itself in various ways. Consorting or living with the dead has been observed as a characteristic of melancholia. Individuals have inhabited grave-yards, preferring the proximity and association of corpses with which they had no tie, to the cheerfulness and comforts of home; and there is recorded one notorious case in which a gentleman, although on bad terms with his wife while alive, carried her body with him through India, scandalizing the natives and outraging the feelings of all by placing the coffin under his bed. This hideous tendency may enter into certain developments of cannibalism where the feast is celebrated in memory of a departed friend, rather than in triumph over a slain foe. It is affirmed that there were anthropophagous epidemics in 1436 and 1500; and the history of vampirism connects that delusion with the moral perversion now described. Patients in asylums, especially in continental asylums, are still often encountered who bemoan the crime of having devoured the dead and violated charnel-houses. The most extraordinary exhibition of necrophilism is where individuals, not in fancy but in reality, have exhumed corpses to see them, to kiss them, to carry them away to their own homes, or to mutilate and tear them to pieces. It is worthy of notice that, so far as such cases have been observed in this country, they have been confined to communities living in remote places, of rude and unenlightened character, and cherishing the superstitions of ages and states of society with which they have no other connection, and of which they have almost lost the recollection.—*Annales, Medico-Psychologiques*, t. viii. p. 472.

NECROP'OLIS, a Greek term, meaning the city of the dead, and applied to the cemeteries in the vicinity of ancient cities. It occurs in classical antiquity only as applied to a suburb of Alexandria, lying to the w. of that city, having many shops and gardens and places suitable for the reception of the dead. The corpses were received and embalmed in it. Here Cleopatra, the last of the Ptolemies, applied the asp to her breast to avoid the ignominy of being led in triumph by Augustus. The site of the necropolis of ancient Alexandria seems to have been where are now the catacombs, consisting of galleries and tombs hollowed out of the soft calcareous stone of which the city is built, and lying at the extremity of the city. The term necropolis is now, however, used in a much more extended sense, and applied to all the cemeteries of the ancient world. These consisted either of tombs, constructed in the shape of houses and temples, and arranged in streets, like a city of the dead; or else of chambers hollowed in the rock, and ornamented with façades to imitate houses and temples. Such cemeteries are to be distinguished from the *columbaria*, or subterraneous chambers of the Romans, in which their urns were deposited; or the rows of tombs along the Via Appia; or the cemeteries of the Christians, whose bodies were deposited in the ground. The most remarkable necropolises are that of Thebes in Egypt, situated at a place called Gournah, on the left bank of the Nile, capable of holding 3,000 persons, and which it is calculated must at least have contained 5,000 mummies; those of El-Kab or Eileithyia; of Beni-Hassan, or the Speos Artemidos; and of Madfun or Abydos; of Siwah or the oasis of Ammon. See OASIS. In Africa the necropolis of Cyrene is also extensive; and those of Vulci, Corneto, Tarquinii, and Capua are distinguished for their painted tombs (see TOMB), and the numerous vases and other objects of ancient art which have been exhumed from them. Large necropolises have also been found in Lycia, Sicily, and elsewhere.

Strabo, xviii. pp. 795–799; Plutarch, vit Anton; Letronne, *Journal des Savans*, 1828, p. 103; Dennis, *Cities and Cemeteries of Etruria*, i. 412, i. 276–358.

NECROSIS (Gr. *nĕkros*, dead) is a term employed to denote the death or mortification of bone, but often restricted to the cases in which the shaft of a long bone dies, either directly from injury or from violent inflammation, and is inclosed by a layer of new bone; the death of a thin superficial layer, which is not inclosed in a shell of new bone, being usually termed *exfoliation*.

The bones of the lower extremity—the femur and tibia—are those which are most frequently affected by necrosis. The lower jaw is, however, extremely often affected by it in persons engaged in making lucifer-matches, the disease being set up by the pernicious action of the vapor of phosphorus. The dead bone, known as the *sequestrum*, generally consists of the circumference of the shaft only, and not of the interior, and the inside of the dead portion presents a rough appearance, as if worm-eaten. If the membrane investing the bone (the periosteum) remain healthy, it deposits lymph, which speedily ossifies, forming a shell of healthy bone, which completely invests the dead portion.

The essential point in the treatment is the removal of the *sequestrum*, which is too purely a surgical operation to be described in these pages.

NECTAR, the name given by Homer, Hesiod, Pindar, and the Greek poets generally, and by the Romans, to the beverage of the gods, their food being called *ambrosia* (q.v.). But Sappho and Alcman make nectar the food of the gods, and ambrosia their drink. Homer describes nectar as resembling red wine, and represents its continued use as causing immortality. By the later poets nectar and ambrosia are represented as of most delicious odor; and sprinkling with nectar, or anointing with ambrosia, is spoken of as conferring perpetual youth, and they are assumed as the symbols of everything most delightful to the taste.

NECTARINE. See PEACH.

NECTARY, in botany, an organ in the flowers of many phanerogamous plants, devoted either to the secretion or the reception of honey. Of the former kind are nectariferous glands, scales, and pores; of the latter, tubes, cavities, etc. But the term was for a long time very vaguely employed by botanists, and seemed to be found convenient for the designation of any part of a flower for which no other name was known. Thus amongst the parts called nectaries by the older botanists may be found those now called *disk* (q. v.), and that which bears the name of *corona* (q v.).

NEDJED, or NEJD. See WAHABIS, *ante.*

NEEDFIRE (Ger. *nothfeuer;* allied to Sw. *gnida*, to rub; Eng. *knead*), fire obtained by the friction of wood upon wood, or the friction of a rope on a stake of wood, to which a wide-spread superstition assigns peculiar virtues. With varieties of detail, the practice of raising needfire in cases of calamity, particularly of disease among cattle, has been found to exist among most nations of the Indo-European race. It has been supposed effectual to defeat the sorcery to which the disease is assigned. When the incantation is taking place, all the fires in the neighborhood must be extinguished, and they have all to be relighted from the sacred spark. In various parts of the Scottish highlands the raising of needfire was practiced not long ago, and it is perhaps still had recourse to in some very remote localities. The sacrifice of a heifer was thought necessary to insure its efficiency. The ways of obtaining fire from wood have been various; one is by an apparatus which has been called the "fire-churn," a cylinder turning on a pivot, and furnished with spokes, by means of which it is made to revolve very rapidly, and fire is generated by the friction. Fire struck from metal has been supposed not to possess the same virtue, and in some instances the persons who performed the ceremony were required to divest themselves of any metal which might be about them. In its origin the fire-churn was considered a model of the apparatus by which the fires of heaven were daily rekindled. It is still in daily use in the temples of the Hindus. The same superstition was doubtless the origin of the story of Prometheus (q.v.). See Grimm's *Deutsche Mythologie*; Supplement to Jamieson's *Scottish Dictionary.*

NEEDLE-GUN. See BREECH-LOADING ARMS AND NEEDLE-GUNS, *ante.*

NEEDLES are instruments of metal, or other material, for the purpose of carrying the thread in sewing, embroidery, knitting, netting, and other similar operations. They are generally made of metal, but bone, ivory, and wood are also used; for ordinary needlework, called sewing, they are made of fine steel, and are too well known to need description; for other kinds of work they are often much larger and differently formed. according to the requirements of the work to be done.

Needle-making is an important branch of industrial art, and it has of late years attained to extraordinary perfection. Small bars of steel, not thicker than a good-sized bristle, can be made perfectly round, pointed at one end with wonderful accuracy, pierced at the other end with an oval hole, the sides of which are so smoothly rounded that there is no friction upon the thread, and the whole of each instrument, not more than an inch in length, beautifully polished, and sold at less than a shilling per hundred, notwithstanding that a large part of the operations required in their manufacture are manual. The first operation, after the wire has been selected and its thickness accurately gauged, is to cut it into eight-feet lengths; this is done by winding it in a coil of 16 ft. circumference, and then cutting this coil into exact halves with powerful cutting shears. The coiling of the wire is so managed that there are 100 pieces in each half when cut; the bundles of 100 wires are again cut into the necessary lengths for two needles; and so well arranged are the cutting shears, that a man can easily cut enough for 1,000,000 needles in a day of 12 hours. The pieces cut from a coil, although now reduced to the length of two small needles, are nevertheless somewhat curved; they are therefore collected into bundles of about 6,000, and placed in two iron rings, which hold them loosely together; they are then slightly softened by firing, and are laid on an iron plate or bench. and are pressed with a small curved bar in two or three positions, by which the operator manages to make them all perfectly straight. They are now taken to the grinder, who sits in front of his grindstone upon a seat which is hollow, and forms an air-shaft open towards the stone; through this a blast of air is forced when the wheel is in motion, which carries away from the grinder every particle of the subtle dust from the needle points and the stone. Before this humane invention, which has rendered the operation quite innocuous, the loss of life in this manufacture was more serious than in any other industrial occupation. The operator, with great tact, holds about 25 of the wires, by means of his thumb pressed against the inside of his fingers, the wires, which are held straight and applied to the grindstone, being dexterously turned round on the inside of the hand by means of the thumb, until they are ground sharp at one end; they are then reversed, and the other ends are similarly sharpened. They are next taken to the *impressing* machine, which in principle consists of a weight hanging to a block, which is raised by the hand and let fall at pleasure; the wires are placed in succession under this, so that the falling weight strikes each wire exactly in the middle, and there flattens it. The hardening of the flattened part by the blow is removed in the annealing oven, and the holes are next punched, two in each flattened portion. These are either done by hand-punches worked by children, who acquire great nicety in the operation, or by a machine on the same principle as the *impressing* machine; this not only punches the two holes, but also forms a small cross-cut between them, which is otherwise made by a file. At this cross-cut the wire is broken in two, and may now be regarded as two rudely-formed needles, each having a flattened and pierced head. A number of these are now threaded (*spitted*) on a thin wire, and are placed in a vise, which holds them firm and straight, so that the workman can file the heads on the top and sides, so as to remove all the burred edge. The next process is *oil tempering*, for which they are made hot, and immersed in sufficient oil to coat them thoroughly; the oil is then burned off, an operation which renders the needles brittle. They are then weighed out into lots of about 500,000 each, and after being shaken so that they lie side by side, they are laid on a square piece of strong canvas, and a quantity of sand and emery-powder being mixed with them, they are corded up very securely into a long roll from 18 in. to 2 ft. in length. A number of these rolls or bundles are placed on a movable wooden slab, in the *scouring machine*, and over them is placed another heavily weighted slab. The action of the machine, of which these slabs form part, is to move them backward and forward in opposite directions, the bundles of needles acting as rollers, the pressure upon which works the inclosed needles, sand, etc., together, so that after 8 to 10 hours, which this operation occupies, instead of the blackened appearance they had when it commenced, they are white and silvery-looking. They are now removed to an exactly similar machine, where they are polished. Here they are separated from the sand and emery, and are removed to other canvas squares; and when mixed up with a paste of *putty-powder* and oil, are again corded up, and made to roll backward and forward under the weighted wooden slab of the *polishing machine* for four hours more. The next process is to remove them from the canvas, and agitate them in a vessel with soft-soap and water, to remove the oil and putty-powder, and next to dry them in ash-wood saw-dust. They are now highly polished and well tempered, but not all of exactly the same length, nor are the eyes perfect; they are therefore passed to a person who, by nice management of a small gauge, sorts them very quickly into certain lengths (*evening*), and arranges them all in one direction (*heading*). They then pass on to be drilled, an operation requiring great nicety, as the small oval holes have to be so polished all round, as not to cause any friction on the thread in sewing with them; a clever workman will drill and polish the holes of 70,000 needles per week. The needle is now practically finished, but many minor operations are considered necessary to produce high-finish; these we purposely omit, to avoid complicating our description. It is, however, worthy of remark, that this little instrument, which costs so much labor for its formation, has by these operations acquired immense value. The wire of which the ordinarily-sized needles are made is so thin, that 5¼ lbs. go to form 74,000 needles. Of ordinary sized needles, 2¼ millions weigh 3 cwt., and are worth rather more than £200, although the steel wire of which they were made was only worth £14 at the commencement of the manufacture. English-made needles are the best in the world, and are chiefly made in Redditch and the neighborhood, where, and in other parts of the county of Worcester, this manufacture employs a large number of persons.

NEEDLES, The, a cluster of five rocks on the w. point of the Isle of Wight, pyramidal in form: their tops are white, and of a chalky formation; their bases black; they are curiously streaked throughout with strata of black flint; a light-house has been placed on the outer one. They were probably caused by the waves beating against the sharp cliffs of the island, and their gradual washing away is attributable to the same cause. But three of the rocks are noticeable now, the tallest one, some 120 ft. in height, having fallen into the water in 1764.

NEEF or NEEFS, Pieter the Elder, 1570–1651: b. Antwerp. His numerous architectural paintings usually represent church interiors illuminated with the glow of torches or of candles. He was distinguished for his thorough knowledge of perspective by which he was able to give great effect to a small canvas. His treatment was delicate, refined, and extraordinarily clear; he understood the harmonious modulation of colors and the power of chiaroscuro, but he generally intrusted the painting of the figures introduced into his pictures to Teniers, Franks, Breughel, and Van Thulden. His works are to be found in the galleries of Dresden, Vienna, Paris, and Gotha. His son **Pieter Neefs** was also a painter, but had less talent. He was a pupil of the younger Steenwijk.

NEELE, Henry, 1798–1828; b. London; studied law while quite young, but gave up that profession, choosing rather to lead a literary life. He was a well-known poet and critic, and published *Odes and other Poems*, 1817, delivered *Lectures on Shakespeare*, 1819, and published *Dramatic and Miscellaneous Poetry*, 1823, and *Romance of English History*, in 3 vols., 1827. In the latter year he gave a course of lectures on English poets of the period from Chaucer to Cowper, which were brought out in book-form after his death, styled *Literary Remains*. He committed suicide while temporarily insane. His poems won high praise.

NEELY, Henry Adams, d.d.; b. N. Y., 1830; graduated at Hobart college, 1849, and was tutor there until 1851; became assistant-rector in Calvary church (Prot. Epis.) Utica, in 1852, and, in 1854, rector of Christ church, Rochester. He married Mary D[illegible]afield in 1858, and returned to Hobart college as chaplain, 1862. He was appointed assistant to Trinity church, New York, and rector of Trinity chapel, two years later. In 1867 he was consecrated bishop of Maine.

NEEM-TREE. See Meliaceæ.

NEEMUCH', or Nimach, a t. of India, in the territory of Gwalior (q. v.), near the n.w. border of Malwa, 320 m. s.w. from Delhi, on a slightly elevated ridge rising from a well-cultivated plain, It is 1476 ft. above the sea. The native population is only about 4,000; but Neemuch has acquired importance on account of a British cantonment established here in 1817. Prior to the sepoy mutiny of 1857–59, the officers' quarters comprised about 80 bungalows, beautifully situated among gardens; but all, except a single bungalow, were destroyed in 1857 by the mutineers, who massacred the Europeans, and kept possession of the fort for some time, till it was captured by brig. Stuart after a siege of fourteen days. The situation of Neemuch is regarded as one of the most healthy in India; the climate is agreeable, the nights cool even in the hot season, the winter seldom so cold as to make fires requisite, and frosts very rare.

NEENAH, a village in Winnebago co., Wis.; situated on the s. side of Fox river, near the outlet of lake Winnebago; on the Milwaukee Northern, the Wisconsin Central, and the Chicago and Northwestern railroads, 90 m. n. by w. of Milwaukee. Pop. of township, 3,123. Has a fine park, and good water power; is a favorite resort for summer travelers.

NEER, Arnould or Aaart, van der, 1619–83; b. Amsterdam; sometimes called the "moonlight painter." His usual subjects are villages with fishermen's huts along the banks of canals. He is most successful in his moonlight pieces.

NEER'WINDEN, a small village of Belgium, in the n.w. corner of the province of Liege, is celebrated in history for the great victory gained by the French under Luxembourg over the English under William III. (July 29, 1693); and also for the defeat of the French under Dumouriez by the allies under the prince of Coburg (March 18, 1793).

NEES VON ESENBECK, Christian Gottfried Daniel, 1776–1858; b. Germany; educated at the Darmstadt gymnasium and the university of Jena. He studied medicine, after practicing which, for a short time, he was called to the chair of botany at the university of Erlangen. He was soon made president of the Leopoldine academy of naturalists, and professor of botany at Bonn, where he was one of the founders of a new botanical institution. In 1830 he accepted the posts of professor of botany and director of the botanic garden at Breslau. He took an active interest in the agitations which preceded the revolutionary movement of 1848, and was a prominent member of a Breslau religious organization named the *Kristkatholiken*, and aiming at various charitable and humanitarian purposes. He lived at Berlin for a time in 1848, participating in the democratic agitation then at its height throughout Europe. Returning to Breslau, he established a "fraternity of workingmen," with the object of diffusing education among laborers, maintaining harmony between them and their employers, etc. This society excited the hostility of the government, which ordered him to dissolve his connection with it. A prosecution was soon instituted against him for living with a woman without having been divorced from his wife. Both, this prosecution and his deposition from the chair of botany in 1852, were supposed to be due to political motives, and the distrust felt by the government for his democratic principles and influence with the laboring classes. Deprived of his salary, he had to sell his library and his collection of botanical specimens. In spite of his reformatory activity, and his researches in regard to spiritualism, in which he was a believer, he found time to continue his botanical studies, and became one of the first botanists of Europe. In his *Handbook of Botany*, 1821, he developed the theory advanced by Goethe in his *Metamorphosis of Plants*, that all the parts of the flower are only variations of the leaf. This work had been preceded by his *Fresh Water Algæ*, 1814; by *System of Fungi and Sponges*, 1816; and by *Plant Substance*, 1819, in which he was assisted by Rothe and Bischof. He published, in 1833, *Genera et Species Asterearum;* in 1836, *Systema Laurinarum;* and in 1841, *Floræ Africæ Australiaris Illustrationes Monographicæ*. In 1852 appeared the first volume of his *Universal Etymology of Nature*. He was a specialist on cryptogamous plants, and in this branch of botany his chief work is *Natural History of the European Water-Liverwort*, 1833–38.

NE EXEAT REGNO is the title of a writ issued by the court of chancery to prevent an individual leaving the kingdom, unless he gives security to abide a decree of that court. The writ was originally resorted to in cases of attempts against the safety of the state, but is now issued in cases where an equitable debt or demand is sought to be substantiated by a bill or proceeding in chancery. The writ is only granted where the party usually resides within the jurisdiction. It resembles the process which is known in the common-law courts as arresting and holding to bail, and in Scotland as arresting a person *in meditatione fugæ*.

NE EXEAT REPUBLICA, another name for the writ *ne exeat regno* (q.v.), the word republic or state being substituted for kingdom. The writ is rarely used in the United States, and chiefly in cases involving a breach of trust or official administration.

NEFF, FELIX, 1798-1829; b. at Geneva, Switzerland. He received his early education from his widowed mother, who was distinguished for piety, and had occasional lessons from some pastor of his native canton. His favorite authors in youth were Plutarch and Rousseau, and he was fond of mathematics and natural history. At an early age he was placed with a florist-gardener, and at 17 entered the army, that he might not longer be a burden to his poor mother. His excellent character and fidelity soon raised him to the rank of sergt. His strict religious principles and the purity of his life provoked the hostility of his associates, and he decided to leave the army. Being advised to enter the ministry he resigned his commission in 1819, and offered himself as a catechist or parish missionary. The first years of his missionary life were spent in the cantons of Geneva, Neufchâtel, Bern, and the Pays de Vaud. In 1821 he went to the destitute district of Grenoble in France, and afterward to Mens in Isère. Religious scruples preventing his being ordained in the established church of Geneva, and his being a foreigner rendering it impossible to obtain ordination from the Protestant church of France, he went to England, and having been ordained in 1823 by the Congregationalists he returned to Mens, the scene of his former labors. But his heart was with the destitute on the mountains, and, turning away from those by whom he was greatly beloved, he went to the high Alps, and labored with great courage and zeal among the descendants of the Vaudois in the wild picturesque valleys of Queyras and Freyssinières. Here he preached, organized schools, dedicated churches, laboring incessantly among those lonely glens and dreary mountains. His pastoral work was performed in a poor Alpine district, comprising 17 isolated villages within a circuit of 80 miles. In one part of his parish the people were so degraded as to be scarcely removed from the condition of barbarians. As they needed education and were unable to pay a teacher, he became school-master as well as preacher. They became so much interested that they built a school-house, he directing the workmen and acting himself as architect and mason. Exhausted by these labors he visited the baths of Plombières, but returned to Geneva without permanent benefit. Companies of the poor people of the Alpine valleys made long journeys on foot through the snow to see their beloved dying pastor.

NEGAPATAM', a t. of British India, in the presidency of Madras, and district of Tanjore, 124 m. s.s.w. from Madras, on a small estuary of one of the many small southern mouths of the Cauvery. The manufacture of cotton and silk fabrics was, in former times, extensively carried on here, but has greatly declined in consequence of the cheapness of British goods. A chief branch of industry is the expression of oil from the cocoa-nut and from oil-seeds. There is a considerable trade with Ceylon. The harbor is suited only for small coasting-vessels; but measures are in progress for its improvement. Negapatam is a terminus of the Great Southern railway of India. It was the capital of the Dutch possessions in India, but was taken by the British in 1781. Pop. '71, 48,525.

NEGATIVE, in photography, is that kind of photographic picture in which the lights and shadows of the natural object are transposed; the high lights being black, and the deep shadows transparent, or nearly so. Negatives are taken on glass and paper by various processes, and should indicate with extreme delicacy, and in reverse order, the various gradations of light and shade which occur in a landscape or portrait. A negative differs from a positive inasmuch as in the latter case it is required to produce a deposit of pure metallic silver to be viewed by *reflected* light; while in the latter, density to *transmitted* light is the chief desideratum; accordingly inorganic reducing and retarding agents are employed in the development of a positive, while those of organic origin are used in the production of a negative. Adopting the collodion process (which has almost completely replaced every other) as a type of the rest, the conditions best adapted for securing a good negative may be briefly indicated, leaving it to the reader to apply the principles involved to any process he may desire to practice.

The possession of a good lens and camera being taken for granted, and favorable conditions of well-directed light being secured, all that is necessary is to establish a proper and harmonious relation between the collodion bath, developer, and time of exposure. A recently iodized collodion will generally be tolerably neutral, in which case, if the developer be at all strong, and the weather warm, the bath should be decidedly acid, or *fogging* will be the result. Should the collodion, however, be red with free iodine, a mere trace of acid in the bath will suffice, while the development may be much prolonged, even in warm weather, without fogging. If the simple fact be borne in mind that the presence of acid, either in the bath collodion or developer, retards the reducing action of the developer, it will suffice to guide the operator in many difficulties. The value of a negative consists in the power it gives of multiplying positive proofs. See POSITIVE PRINTING; also PHOTOGRAPHY.

NEGATIVE QUANTITIES are generally defined as quantities the opposite of "positive" or "numerical" quantities, and form the first and great point of difference between algebra as a separate science and arithmetic. In the oldest treatises on algebra they are recognized as distinct modifications of quantity, and existing apart from, and independent of, positive quantity. In later times, this opinion was vigorously combated by many mathematicians, among whom Vieta occupied a prominent place; but the more eminent analysts retained the old opinion. Newton and Euler distinctly assert the existence of negative quantities as quantities less than zero, and the latter supports his opinion by the well-known illustration of a man who has no property, and is £50 in debt, to whom £50 requires to be given in order that he may have nothing. After all, this discussion is little more than a verbal quibble, though interesting from the prominent position it for a long time held. It had its rise in the difficulty of satisfying the requirements of a constantly progressing science by the use of signs and forms retaining their original limited signification. It was soon felt that the limited interpretation must be given up; and accordingly an extension of signification was allowed to signs and modes of operation. + and –, which were formerly considered as merely symbols of the arithmetical operations of addition and subtraction, were now considered as "general cumulative symbols, the reverse of each other," and could signify gain and loss, upward and downward, right and left, same and opposite, to and from, etc. Applying this extended interpretation of signs to a quantity such as –4, we obtain at once a true idea of a negative quantity; for if +4 signifies 4 in. *above* a certain level, –4 signifies 4 in. *below* that level, and therefore, though a positive quantity in itself (a negative being, strictly speaking, an impossible existence), it may be fairly considered to be less than zero, as it expresses a quantity less by 4 than 0 inches above the level. Keeping this idea in view it has been conventionally agreed to admit the existence of negative quantities as existing *per se*. The only errors which can flow from this arise from misinterpretation of results, for the four fundamental operations of addition, subtraction, multiplication, and division are unaffected by the extended interpretation of signs. The following is an illustration of the value of an extended interpretation of the negative sign, showing at the same time how much more general are the ideas conveyed by algebraic expressions than by ordinary language: If at the present time a father is 50 years, and his son 20 years old, when will the father be three times as old as his son. This problem when solved, gives –5 as the number of years which must elapse before the father's age is three times the son's. Now, at first sight, this result appears to be absurd, but when we consider the terms of the problem, its explanation is easy. The question asked pointed to a number of years *to come*, and had the result turned out to be *positive*, such would have been the case, and the fact of its being negative directs us to look in a "contrary" direction, or backward to time *past;* and this is found to satisfy the problem as five years "ago" the father was 45 and his son 15.

Negative quantities arise out of the use of general symbols in subtraction, as in the formula $a - b$, where we may afterward find that b is greater than a. See SUBTRACTION.

NEGAU'NEE, a village in Marquette co., Mich., 12 m. s.w. from Marquette on Iron mountain; on the Chicago and Northwestern railroad, and at the junction with the Marquette, Houghton and Ontonagon railroad; pop. '74, 3,741. Teal lake, a beautiful sheet of water, is on the n. border. It has large iron mines in which a considerable capital is invested. It has blast furnaces, a nitro-glycerine factory, banks, public schools, churches, and weekly newspapers.

NEGLEY, JAMES S., b. Penn., 1826; was a student at Western university; entered the Mexican war as a private, and at the outbreak of the rebellion enlisted within 8 days a brigade of volunteers for 3 months, and was appointed brig.gen. April 19, 1861; fought with the army of the Ohio in Alabama and Tennessee; was in command at Lavergne Oct. 7, 1862, where he defeated Anderson and Forrest; promoted to maj.gen. for his bravery at Stone river, Dec., 1862, and served in the Georgia campaign. In 1869 he was elected to congress from Pittsburg, at which city he resides.

NEGLIGENCE, in law, such want of due diligence and caution, though unaccompanied by injurious or criminal intent, as will give ground for a civil action for damages or will justify a criminal prosecution. The obligation to exercise caution may arise from a contract, express or implied, or from a rule or presumption of law; and the degree of care and caution which must be exercised varies greatly under different circumstances. The theoretical distinction between gross negligence and fraud or criminal intent is clear, but in practice it is often difficult to decide which exists in the particular circumstances. Where a contract is for any reason contrary to law, negligence in carrying out its provisions is, of course, no cause for action; and if an infant neglect to carry out a contract voidable on the score of infancy, he is not liable; though he may often be held for negligence amounting to a tort and altogether outside of contract obligations. If the negligence relate to contract, only a party to that contract can sue, whoever may be injured indirectly, while in torts it is the person receiving the actual injury who has a claim for damages. It is not enough to constitute a valid claim that there has been a want of care; for, first, the negligent party may have been under no obligations to exercise care toward the person injured: thus, where a railway accident is brought about by the grossest negligence on the part of the company, if an individual passenger were injured who was obtaining his passage by fraud, he would have no claim, and, secondly, though the obligation might exist and negligence occur, yet it might be so slight compared with the nature of the transaction as to make it obviously unjust to hold the negligent party. Again, if the injured party has himself been negligent and has thus "contributed" to his own damage, he will have no action. This principle of "contributory negligence" is based upon public policy in part and in part upon the belief that a loss brought upon a plaintiff by his own act should not give him compensation. But it is not a good bar to an action to prove that, if the plaintiff had not done a certain act, he would not have been injured; the negligence, like that of the defendant, must have been actual, and care required of him by some legal or natural obligation. It is generally held that the burden of proof is on the defendant as to contributory negligence; that is, the plaintiff or injured party will be supposed to have acted with due care until the contrary is shown. The doctrine of contributory negligence presents many difficult questions on trial, not so much as to the law, as in determining the respective rights of the parties and the degree in which either was or both were negligent. By the common law, if death were occasioned by negligence, no action for damages could be had by the near relatives; but by an English statute and by similar enactments in most of the states of this country, suit may be brought by the administrator or executor in behalf of a husband or wife or next of kin, wherever death has been caused by negligence or wrongful act. Where the original injury has been increased by the willful act or negligence of the plaintiff, he cannot include the more remote damage in his claim. Thus, where physical injury is received and medical care is refused—the refusal resulting in permanent loss of health which would otherwise not have followed—there can be no claim for damages on that account. Every man is bound so to use his own property as not to injure another. Thus, the owner of animals which are vicious or have a contagious disease is bound to keep them under proper restraint; and the digger of a pit on his own land is liable, if it be near an unfenced highway and unprotected. Professional men are bound to exercise a fair average skill in their profession. A superior is, in general, responsible for the negligence of an agent or employee when acting in the scope of his employment, but the servant is, in turn, liable to the master. Most important decisions as to the degree of care required of railroad corporations may be seen in *Redfield on Railroads*. In general it may be said that extraordinary care is demanded of all public carriers. As to negligence by public officers in performing their official duties, see OFFICE. Three degrees of care or diligence and corresponding degrees of negligence, are usually described, apportioned to the relative circumstances and responsibilities of the parties: where one is required to use but slight care and is responsible only for gross negligence; where he is required to use ordinary care and is liable for ordinary neglect; and where he is required to use very great care and is responsible for but slight neglect. This classification is applied more especially to the subject of Bailments (q.v.). Where the bailment is for the benefit of the bailor, but slight care is required of the bailee; where the benefit is mutual, as in cases of hiring, ordinary care is required; and where the bailee is the only one who benefits by the bailment, extraordinary diligence is required and the slightest negligence will give cause for action. The exceptions to the second statement are the bailments to common-carriers and innkeepers where public policy requires that a very great degree of care should be exercised. Negligence, not coexistent with any criminal intent, may in certain cases constitute a crime. Thus, where the negligent act of one man results in the death of a second, the circumstances may make the first guilty of manslaughter. So where an officer of the law allows a prisoner to escape, not having been tampered with, but through mere carelessness, he is criminally guilty. The subject of negligence may be found treated in detail in Shearman on *Negligence*, Addison and Hilliard on *Torts*, Redfield on *Railroad Law*, and Bishop on *Criminal Law*.

NEGOTIABLE PAPER. See BILL OF EXCHANGE; EXCHANGE; *ante*.

NEGRELLI, ALOYS VON, 1799–1858; b. in the Tyrol; constructed the first Swiss railroad, from the German border to Zürich, also the first Austrian railroad, completed 1841; the Austrian Northern railroad secured him as chief inspector, which position he held till 1849, when he was appointed director of public works. In 1855 he assumed full charge of all Austrian railroads, from which position he was called, two years later, by the viceroy of Egypt, to superintend the cutting of the Suez canal, at which work he spent the last year of his life.

NEGRI'TOS, or NEGRILLOS (*Spanish*, diminutive of negroes), is the name given by the Spaniards to certain negro-like tribes inhabiting the interior of some of the Philippine islands, and differing essentially both in features and manners from the Malay inhabitants of the Eastern archipelago. They bear a very strong resemblance to the negroes of Guinea, but are much smaller in size, averaging in height not more than 4 ft. 8 in., whence their appellation of Negritos, or little negroes. They are also called by the Spaniards *Negritos del Monte*, from their inhabiting the mountainous districts for the most part; and one of the islands where they are most numerous bears the name of

Isla de los Negros. These Negritos are also known by the names Aeta, Aigta, Ite, Inapta, and Igolote, or Igorote. They are described as a short, small, but well-made and active people, the lower part of the face projecting like that of the African negroes, the hair either woolly or frizzled, and the complexion exceedingly dark, if not quite so black as that of the negroes. The Spaniards describe them as less black and less ugly than the negroes—*Menos negros y menos feos.* All writers concur in speaking of them as sunk in the lowest depths of savagedom, wandering in the woods and mountains, without any fixed dwellings, and with only a strip of bark to cover their nakedness. Their only weapons are the bow and arrow; and they live upon roots, wild fruits, and any sort of animals that they can surprise in their haunts or conquer in the chase. By the Malays they are despised and hated; and the buffalo-hunters in the woods, when they meet with them, do not scruple to shoot them down like wild beasts or game. "It has not come to my knowledge," says a Spanish writer, "that a family of these negroes ever took up their abode in a village. If the Mohammedan inhabitants make slaves of them, they will rather submit to be beaten to death than undergo any bodily fatigue; and it is impossible, either by force or persuasion, to bring them to labor." The same writer, an ecclesiastic, speaks of them as gentle and inoffensive in their manners, whenever he himself came in contact with them; and although informed that some of them were cannibals, he was not inclined to believe the report. Dr. Carl Scherzer, the historian of the circumnavigation of the *Novara,* when at Manilla, had an opportunity of seeing a Negrita girl, whom he thus describes: "This was a girl of about 12 or 14 years of age, of dwarf-like figure, with woolly hair, broad nostrils, but without the dark skin and wide everted lips which characterize the negro type. This pleasing-looking, symmetrically-formed girl had been brought up in the house of a Spaniard, apparently with the pious object of rescuing her soul from heathenism. The poor little Negrilla hardly understood her own mother-tongue, besides a very little Tagal, so that we had considerable difficulty in understanding each other.

According to Spanish statements the Negritos are found only in five of the Philippine islands—namely, Luzon, Mindoro, Panay, Negros, and Mindanao—and are estimated at about 25,000 souls. Remnants of them exist, however, in the interior of some of the other islands in the Eastern archipelago; and they are scattered, also, though in small numbers, through certain islands of Polynesia. They are altogether an island people, and are hence treated of by Prichard under the designation of Pelagian negroes. By Dr. Pickering they are treated of as a distinct race, resembling the Papuan, but differing from it in the diminutive stature, the general absence of a beard, the projecting of the lower part of the face or the inclined profile, and the exaggerated negro features. The hair, also, is more woolly than that of the Papuans, though far from equaling that of the negroes in knotty closeness. By Latham the Negritos are classified 'under the subdivision of Oceanic Mongolidæ, C," which subdivision is further modified by him into the designation of "Amphinesians" and "Kelænonesians." The Negritos out of the Philippine islands are found for the most part in the islands embraced under the latter designation, as New Guinea, New Ireland, Solomon's isles, Louisiade, New Caledonia, and Tasmania or Van Diemen's Land. Except in the last-mentioned island, however, the Negritos, strictly speaking—that is, the blackish people with woolly hair—do not preponderate over the other native tribes less strongly marked with negro features; while in Tasmania itself the race has almost entirely disappeared, amounting at present to not more than two or three dozen souls. Dr. Pickering is of opinion that the Negrito race "once occupied more space than it does at this time, and that it has in many instances preceded the dissemination of other races." We conclude with a description of a Negrito native of Erromango (the island where the missionary Williams was murdered), supplied to Dr. Pickering by Horatio Hales, his associate in the United States exploring expedition: "He was about 5 ft. high," says Mr. Hales, "slender and long limbed; he had close woolly hair, and retreating arched forehead, short and scanty eyebrows, and small snub nose, thick lips (especially the upper), a retreating chin, and that projection of the jaws and lower part of the face which is one of the distinctive characteristics of the negro race. . . . . Placed in a crowd of African blacks, there was nothing about him by which he could have been distinguished from the rest." See PAPUANS and POLYNESIANS.

NE'GRO, RIO. See RIO NEGRO.

NEGROES (from the Spanish word *negro,* black; Lat. *niger*) is the name given to a considerable branch of the human family possessing certain physical characteristics, which distinguish it in a very marked degree from the other branches or varieties of mankind—more especially the so-called whites or Europeans. In Blumenbach's five-fold division of mankind the negroes occupy the first place under the variety *Ethiopian,* which likewise embraces the Kaffers, Hottentots, Australians, Alforians, and Oceanic negroes. In Latham's threefold division they are placed among the *Atlantidæ,* and form the primary subdivision of *Negro Atlantidæ* in that author's classification; while in Pickering's eleven-fold division they occupy the last place in his enumeration of the races of mankind.

Both Prichard and Latham strongly protest against the common error of looking upon the term negro as synonymous with African. "It ought to be remembered," says the former, "that the word negro is not a national appellation, but denotes the ideal type constituted by the assemblage of certain physical characteristics, which is exemplified in the natives of Guinea in western Africa, and in their descendants in America and the West Indies." And Latham in like manner observes: "No fact is more necessary to be remembered than the difference between the negro and African; a fact which is well verified by reference to the map. Here the true negro area—the area occupied by men of the black skin, thick lip, depressed nose, and woolly hair—is exceedingly small; as small in proportion to the rest of the continent as the area of the district of the stunted Hyperboreans is in Asia, or that of the Laps in Europe. Without going so far as to maintain that a dark complexion is the exception rather than the rule in Africa, it may safely be said that the hue of the Arab, the Indian, and the Australian is the prevalent color. To realize this we may ask, What are the true negro districts? and what those other than negro? To the former belong the valleys of the Senegal, the Gambia, the Niger, and the intermediate rivers of the coast, parts of Sudania, and parts about Sennaar, Kordofan, and Darfúr; to the latter the whole coast of the Mediterranean, the desert, the whole of the Kaffer and Hottentot areas s. of the line, Abyssinia, and the middle and lower Nile. This leaves but little for the typical negro." Bearing in mind this limitation of the primitive area of the negro, we shall next proceed to speak of his prominent physical characteristics.

The negro has a black skin, unctuous and soft; woolly hair; thick lips; the lower part of the face prognathic, or projecting like a muzzle; the skull long and narrow; and a low, retreating forehead. The skull of the negro is remarkably solid and thick, so that in fighting they often butt against each other like rams, without much damage to either combatant; and it is likewise so flat that burdens are easily carried upon it. According to Camper's lateral admeasurement, the head of the negro shows an angle of 70°, while that of the European shows one of 80°, on which difference of 10°, as he considered, depends the superior beauty of the latter. There is not much dependence, however, to be placed on such a mode of admeasurement; and the same may be said of Blumenbach's vertical method. According to this, a considerable difference would appear to exist between the skull of the negro and that of the European. "But," says Dr. Prichard, "I have carefully examined the situation of the foraman magnum in many negro skulls; in all of them its position may be accurately described as being exactly behind the transverse line bisecting the antero-posterior diameter of the basis cranii. This is precisely the place which Owen has pointed out as the general position of the occipital hole in the human skull. In those negro skulls which have have the alveolar process very protuberant, the anterior half of the line above described is lengthened in a slight degree by this circumstance. If allowance is made for it, no difference is perceptible. The difference is in all instances extremely slight; and it is equally perceptible in heads belonging to other races of men, if we examine crania which have prominent upper jaws. If a line is let fall from the summit of the head at right angles with the plane of the basis the occipital foramen will be found to be situated immediately behind it; and this is precisely the case in negro and in European heads." There is, in fact, neither in this respect—the conformation of the negro skull—nor in any other, solid ground for the opinion hazarded by some writers, and supported either through ignorance or from interested motives by many persons—that the negro forms a connecting link between the higher order of apes and the rest of mankind. The difference is certainly considerable between the highest European and the typical negro, but the gulf between them both and the highest of the simiæ is so nearly of the same width that the difference is scarcely distinguishable. But the skin, hair, skull, lips, maxillary profile, and general facial appearance of the negro, are not the only features that distinguish him in a great degree from the European, and seem to stamp him as a distinct variety of the human race. "In the negro," says Prichard, "the bones of the leg are bent outwards. Soemmering and Lawrence have observed that the tibia and fibula in the negro are more convex in front than in Europeans; the calves of the legs are very high, so as to encroach upon the hams; the feet and hands, but particularly the former, are flat; and the os calcis, instead of being arched, is continued nearly in a straight line with the other bones of the foot, which is remarkably broad. As to the supposed excessive length of the fore-arm in the negro, a circumstance also dwelt upon as showing an approach to the anthropoid apes, facts are altogether against the statement; there being no greater difference than is observable in individuals of any other variety of mankind. In stature the negro is very much on a par with the European, often reaching 6 ft., and rarely declining below five and a half. Into the discussion as to the cause of the blackness of the skin in the negro we have not space to enter. It is generally supposed to depend upon the greater amount of pigment cells in the *rete Malpighii*, and in the greater number of cutaneous glands, as compared with the skin of Europeans. In the skin of the negro there is much oily matter, and he perspires profusely, which serves to keep him in health, while it diffuses a smell far from agreeable to bystanders whose olfactory nerves are at all sensitive. Of the hair of the negro, Dr. Prichard remarks: "I am convinced that the negro has hair properly so-called, and not wool. One difference between the hair of a negro and that of a European consists in the more curled and frizzled condition of the former. This, however, is only a difference in the degree of crispation, some European hair being likewise very crisp. Another difference is the greater quantity of coloring matter or pigment in the hair of the negro. It is very probable that this quality is connected with the former, and is its cause, though we cannot determine in what manner one depends upon another; but as these properties vary simultaneously, and are in proportion one to another, we may infer that they do not depend upon independent causes."

The negroes, in their native seat, comprise various independent tribes, which are thus classified and enumerated by Dr. Latham: 1. *Western Negro Atlantidæ*, embracing the Woloffs, Sereres, Serawolli, Mandingos, Felups, etc.; Fantis, etc.; the Ghá, the Whidah, Maha and Benin tribes, the Grebo, etc. 2. *Central Negro Atlantidæ*, embracing the Yarriba, the Tapua, Haussa, Fulahs, Cumbri, Sungai, Kissúr, Bornú, etc.; Begharmi, Mandara, Mobba, Furians, Koldagi. 3. *Eastern Negro Atlantidæ*, embracing the Shillúk, etc.; Qámamyl, Dallas, etc.; Tibboo, Gongas. This list might, of course, be still further enlarged by reference to the works of Barth, Livingstone, Speke, and other travelers, whose researches have been published since the appearance of Dr. Latham's *Varieties of Man*, in 1850.

While these several tribes have their distinctive peculiarities, they yet bear a strong general resemblance to each other, not only in their physical appearance, but in their intelléctual capacities, moral instincts, customs, and manners. The negro intellect is generally acknowledged to be inferior not only to the European, but to that of many primitive races not as yet brought within the pale of civilization, while it is superior to that of the Australians, Bushmen, and Esquimaux. Some tribes are sunk in the lowest depths of barbarism, and are either ferocious savages, or stupid, sensual, and indolent. This is the case, for the most part, according to Prichard, where the exaggerated negro type is discernible, as among the Bulloms, Papals, and other tribes on the coast of Western Guinea; also among the tribes near the slave coast, and in the bight of Benin, where the slave-trade has been carried on to the greatest extent. In other parts they show a capacity for practicing the arts of life. They are ingenious in the construction of their dwellings, they have some knowledge of the working of iron and other metals, they manufacture arms, dress and prepare the skins of animals, weave cloth, and fabricate numerous useful household utensils. Neither are they altogether deficient in a knowledge of agriculture. These marks of civilization are, for the most part, apparent in the districts either wholly or partially converted to Mohammedanism. Mungo Park, in his account of Sego, the capital of Bambarra, describes it as a city of 30,000 inhabitants, with houses of two stories high, having flat roofs, mosques in every quarter, and ferries conveying men and horses over the Niger. "The view of this extensive city," he says, "the numerous canoes upon the river, the crowded population, and the cultivated state of the surrounding country, formed altogether a prospect of civilization and magnificence which I little expected to find in the bosom of Africa." All tribes of negroes appear to be passionately fond of music, and show no little skill in the manufacture of musical instruments. They also express their hopes and fears in extemporary songs. Where Mohammedanism has not been introduced, the religion of the negroes is nothing but a debased *fetish* worship. They make fetishes of serpents, elephants' teeth, tigers' claws, and other parts of animals, at the dictation of their *fetish man*, or priest. They also manufacture idols of wood and stone, which they worship; and yet, under all this, they have some idea of a Supreme Being. They believe in good and evil spirits, and are perpetually practicing incantations to ward off the baneful influence of their spiritual enemies. Their religion, in fact, is one altogether of fear; and as this generally leads to cruelty, we find them for the most part indifferent to the sacrifice of human life. In some parts they even offer up human victims to propitiate their deities. They are cruel to their enemies and prisoners, and often shed blood for the mere savage delight they experience in seeing it flow from their victims. We need only allude to the inhuman *customs*, as they are called, of Dahomey, and the *Yam* and *Adai customs* of the Ashantees, as described by Bowdich, in support of this statement.

This same indifference to human suffering, coupled with the passion of avarice, has doubtless been the mainspring of the slave-trade carried on during so many centuries between the negroes and European traders in the western coast of Africa. Begun by the Portuguese as early as 1503, when negro slaves were first imported into the West Indies, sanctioned by Ferdinand of Aragon in 1511, and subsequently by Charles V., legalized in England under Elizabeth, and eventually practiced by every maritime nation of Europe, this infamous trade flourished under the sanction of law as late as the year 1807, when it was happily abolished by act of parliament in Great Britain, and is now treated as piracy by almost every civilized nation. Even still, however, it is practiced by lawless men, notwithstanding the humane efforts of Great Britain, France, and the United States to suppress it; and the encouragement which it has given to the petty chieftains on the slave coast, and the country behind it, to enrich themselves at the expense of their fellow-countrymen, has contributed more than anything else to retard the progress of civilization in that part of Africa. "The region mentioned," says Prichard, "has been the great seat of the exportation of negro slaves, and the tribes on the coast have been reduced to the lowest state of physical and moral degradation by the calamities and vices attendant on that traffic. Throughout negroland, and especially this part of it, the inhabitants of one district in the interior, the dwellers on one mountain, are ever on the watch to seize the wives and children of the neighboring clans, and to sell them to strangers; many sell their own. Every recess, and almost every retired corner of the land, has been the scene of hateful rapine and slaughter, not to be excused or palliated by the spirit of warfare, but perpetrated in cold blood, and for the love of gain."

The custom of polygamy prevails among all the negro tribes, and where these are constituted into nations or kingdoms, as in Dahomey, the sovereign has often as many as two or three thousand wives, whom he occasionally disposes of as presents to his chief officers and favorites.

The languages of the various nations and tribes of negroes are very numerous. Vocabularies of nearly 200 languages have been brought from Africa by the rev. Dr. Koelle. "A slight examination of these vocabularies," says Mr. Edwin Norris, "seems to show that there are among the negro idioms a dozen or more classes of languages, differing from each other as much as the more remote Indo-Germanic languages do." To these negro idioms Dr. Krapf has given the name of *Nigro-Hamitic languages.* These may perhaps have affinities with some of the other African tongues, but not with any of the great well-defined families of languages. For further information upon this subject, we must content ourselves with referring to Dr. Prichard's *Natural History of Man*, and especially to a learned note by Mr. Edwin Norris, in vol. i. of that work, page 823.

Of the condition and prospects of the negroes in the various countries into which they have been imported during the prevalence of the slave-trade, we have scarcely room to speak. They are found in all the West India islands, to the number of about 3,000,000; in the United States, Brazil, Peru, and other parts of South America; also in the Cape de Verde islands, Arabia, Morocco, etc. In the British West India islands they were emancipated from slavery in 1834, and in those belonging to France in 1848. Indeed, slavery now exists nowhere in the West Indies, with the single exception of Cuba. In the United States the negroes amounted in 1870 to 4,880,009. Many of these were emancipated in the course of the late unhappy civil war, all the negroes of secession masters being *declared* emancipated by proclamation of president Lincoln and act of the federal congress; at the same time that indemnities were promised to such loyal states as of their own accord decreed emancipation. Negro slavery in the United States has been utterly destroyed, and the great problem which used to exercise philanthropic minds has been solved—the negro having become a United States citizen at a fearful cost of blood and treasure to both their possessors and their liberators.

NEGRO EXODUS, the name applied to a remarkable migration of freedmen from the southern states of America, in the beginning of 1879, and through that and the succeeding year. On April 7 in the year named, a memorial reached Washington, signed by many of the most influential citizens of St. Louis, Mo., including ex-senators and ex-representatives in congress, the mayor of the city, an ex-minister to Liberia, and others without distinction of party, setting forth the following facts: That during the two weeks preceding April 7 there had arrived by steamboat at St. Louis, having come up the Mississippi river, chiefly from the states of Louisiana and Mississippi, as many as 2,000 negroes, including men and women, old and young, with many of their children. That this multitude expressed an eager desire to reach Kansas; and without exception, so far as could be learned, refused all overtures or inducements to return south, even if their passage back was paid for them. That the condition of the great majority of them was that of absolute poverty; they being clothed for the most part in thin and ragged garments, and supported during their stay in St. Louis partly by public but mostly by private charity. The older ones in this migration had been formerly slaves in the south: all related the same story as to the causes of their departure from their homes—great privation and want from excessive rent exacted for land; murder of their colored neighbors; and personal violence threatened against themselves. The memorial was accompanied by affidavits given by the negroes, relating instances of political and other assassinations, and other cases of personal violence and outrage. This migration continued to flow steadily northward, and the colored people already living in Missouri and Kansas were embarrassed by the necessity imposed upon them of affording assistance to the emigrants, in which they were comparatively little aided by the white population of the north, although earnest calls by the press and by public speakers were made in all directions. By the middle of April it was publicly alleged that certain counties in Mississippi, and some river parishes in Louisiana, were being depopulated, so far as the negroes were concerned; also from interior points numbers had fled to St. Louis by rail. It appeared, on investigation, that this movement had been a matter of discussion among the negroes of the gulf states during several years, but the simultaneous character of the migration was not explicable on any general theory. Nor was the reason for selecting Kansas as the concluding point made clear. The climate of that state was so severe in the early spring that great suffering occurred among those who reached it; but neither this fact, nor the stories of hardships and dangers which were industriously circulated by those interested in opposing the movement, appeared to have the slightest effect in retarding it. It was alleged that local associations had been formed in the southern states for the purpose of encouraging migration northward. There was, however, no evidence of any united action by such associations. It was alleged, also, that the movement had been devised and executed partly in the interest of certain Kansas land speculators, and partly by railroad companies. Mass meetings of colored people were held in New Orleans, Vicksburg, and other southern cities, during the spring of 1879, for the purpose of encouraging the negro migration; while meetings of planters and others employing negro labor were convened, at which the dissatisfied negroes were invited to state their grievances, with a view to redress, if practicable. A colored convention assembled at Nashville, Tenn., on May 7, at which delegates were present from Alabama, Arkansas, Georgia, Indiana, Illinois, Louisiana, Mississippi, Missouri, Nebraska, Ohio, Oregon, Pennsylvania, South Carolina, and Tennessee. The whole subject of the condition of the negro race in the south since the act of emancipation was considered in a report which was offered and adopted, and a plan to improve this condition was submitted. The following resolution was adopted: "Resolved, That it is the sense of this conference that the colored people should emigrate to those states and territories where they can enjoy all the rights which are guaranteed by the laws and constitution of the United States, and enforced by the executive departments of such states and territories; and we ask of the United States an appropriation of $500,000, to aid in the removal of our people from the South." By Aug. 1, more than 7,000 needy colored refugees had arrived in Kansas from the southern states, and the flow continued steadily during the summer. Public attention was diverted from it, however, and as an occasion for popular excitement it gradually died out. During 1880 but little was heard of the exodus, though the migration continued—not to Kansas alone, but to the older and more thickly settled states, and in bands of fewer numbers, thus avoiding notice.

NEGRO MINSTRELSY, a species of singing which originated among the negro slaves of the United States, and is now popular at public entertainments. The sentiment of the earlier of these negro melodies was of the most simple kind, the words mostly broken English, and the harmonies confined chiefly to two chords—the tonic and dominant. How the airs were composed has been a matter of curious inquiry. Some of them are believed to be broken down and otherwise altered old psalm-tunes, which had been caught up by the more musical of the negro race. In some instances, the singing of the melodies is accompanied with grotesque gestures; the effect being to give the idea of good-nature and love of fun in the dark-skinned minstrels. Negro melodies may be said to have been made known by Mr. D. Rice, who, first in New York, in 1831, and afterward in London, created a sensation by his singing of *Jim Crow*. Other songs followed, such as *Jim along Josey* and *Buffalo Gals;* and from less to more, there was created a very characteristically national music, if the Americans will allow us to call it so. Becoming extensively popular, and addressed to fashionable audiences, this negro minstrelsy now comprehends a large variety of songs, with airs of a pleasing kind, the whole much in advance of the original negro compositions. For these improvements, the world is indebted, among others, to Mr. E. P. Christy, who began as conductor of a band of minstrels at Buffalo in 1842, and who established himself in New York in 1846. At first his troupe were called the "Virginia Minstrels," but afterwards they were known as the "Christy Minstrels." Mr. Christy's great success in this species of entertainment brought other leaders and troupes into the field. In most cases, the members of the negro minstrel troupes are only negroes in name, with faces and hands blackened for the purpose. See *Christy's Minstrels' New Songs, with Music*, edited by J. Wade; and other similar collections.

NE'GROPONT. See Eubœa.

NE'GROS, Isla de. See Philippine Islands.

NEGUN'DO, a genus of trees of the natural order *aceraceæ* (see Maple), differing from the maples chiefly in the diœcious flowers, being destitute of petals, and in the pinnated ash-like leaves. The Common Negundo or Ash-leaved Maple, is a native of North America, and now not unfrequent in Britain as an ornamental tree.

NE'GUS, a compound of either port or sherry wine and hot water sweetened with sugar and flavored with lemon-peel and spices. It is a favorite beverage in England, and derives its name from a col. Negus, who claimed to be the inventor.

NEHEMI'AH, son of Hachaliah, probably of royal descent, is first mentioned in the Bible as cup-bearer to Artaxerxes Longimanus in his palace at Shushan about 444 B.C. Having learned the sad fate of the returned colonists in Jerusalem, he prevailed upon the king to send him to his brethren there with full powers "to seek their welfare." For twelve years (444–432), he was untiringly engaged as "governor" in works for their safety from within and without: refortifying the city walls, notwithstanding the hindrances and dangers that beset him on all sides; inducing people from the country to take up their permanent abode in the city, thus promoting its prosperity; and finally, and above all, rekindling the flame of ancient piety and enthusiasm for the observance of the law in the hearts of the rough immigrants. He then returned to Persia, trusting to the new vitality which his reforms had, as he thought, infused into the Jewish commonwealth. But not long afterwards—within a period which it is extremely difficult now to fix—he had again to obtain leave from the king, for the purpose of abolishing the many abuses that had crept in during his brief absence from Jerusalem. His energies now were chiefly directed against the foreign elements mixed up with the people, both privately and publicly. He enforced the rigorous observation of feast and

Sabbath, and rearranged the temple service in accordance with its primeval purity, procuring at the same time the means for its proper support by inducing the people to offer the tithes as of old. His second stay at Jerusalem seems to have lasted between ten and fifteen years; but the dates, as gathered from circumstantial evidence only, are exceedingly vague. He seems to have lived to an old age, but the place and year of his death are unknown. What was the part he took in the formation and redaction of the biblical canon, cannot be investigated in this place. But there can hardly be a doubt that, among the reformatory works undertaken by him, the collection, and perhaps the edition of some of the books of the Old Testament must be included.

The book known under his name (in 13 chapters) is believed only partly his own work. Recent investigation ascribes to him only the first six chapters, part of the seventh, and the last chapter and half; the rest being a compilation by other hands. Its style and character are very simple, free from anything supernatural or prophetic. Its language resembles much that of Chronicles and Ezra, and is replete with Aramaisms and other foreign, partly Persian words. Originally considered a mere continuation of the Book of Ezra, it was by the Greeks and Latins at first called "The Second Book of Ezra." Gradually, however, it assumed its present independent position in the canon after Ezra. It is supposed to have been written or compiled towards the end of Nehemiah's life.

NEHEMIAH, BOOK OF, the latest of the historical books of the Old Testament, was in some ancient Greek and Latin versions called the second book of Ezra or Esdras. This may be accounted for by the intimate official relations between Ezra and Nehemiah, and by the similarity of the circumstances in which they acted and wrote. Without the title, "The words of Nehemiah"—prefixed to the book in modern Hebrew Bibles, and retained in the English version—its first words, "And it came to pass," might appear like a continuation of Ezra. The two books, however, contain internal marks of independent authorship; and there is no more reason to doubt that Nehemiah wrote the one than that Ezra wrote the other. Some, indeed, to prove the difference of authorship, say that Nehemiah exhibits an egotism in speaking of his own actions from which Ezra is free. But to this it is replied that Ezra, in chapters viii. and ix., adopts the same style in speaking of himself in the first person which Nehemiah at greater length employs; and that both authors were led by similar circumstances to write in a similar way. While Nehemiah was doubtless the author of the book, he evidently compiled part of it from historical sources: chapter vii. 6–73, was, as he says, copied from a register which is found also in Ezra ii. The second part, chapters viii.–x., is said to be marked by a Levitical bias, different from the rest of the book, and by the use of the third person instead of the first when speaking of Nehemiah. Hence, some critics have ascribed these chapters to Ezra or some unknown writer. But critical scholars generally consider these views without force. The third part, chapters xi.–xiii., is acknowledged by all to be chiefly, if not altogether, Nehemiah's work.

The book records: Nehemiah's sorrow over the desolations of Jerusalem and his prayer to God for the opportunity to rebuild it; the permission granted him by the king to undertake the work; his arrival at the city and survey of the ruins, followed by the rebuilding of the walls; the opposition of the Jews' enemies, and the plans by which their efforts were defeated; the complaint of the people against the oppression of the nobles, and the redress of the evil; the crafty plot of their enemies, and its defeat by Nehemiah's straightforward boldness; the record of the families that returned first from Babylon, followed by an account of the offerings made by the rich and poor towards the work; the reading of the law by Ezra the scribe, accompanied with a joyful celebration of the feast of tabernacles; the mourning, fasting, and repentance of the people, expressed by a full confession of sin and by a solemn covenant sealed by princes, priests, and Levites, and confirmed with an oath by the whole multitude of the people, to observe the law, sanctify the Sabbath, sustain the services of the temple, and bring in all the tithes; the selection by lot of a tenth of the people to dwell in Jerusalem, and the distribution of the rest through the other cities of the land; the registry of the priests and Levites, and the gathering of the latter from all parts of the land to dwell in Jerusalem; the dedication of the wall of Jerusalem, accompanied with the offering of large sacrifices and the utterance of great joy which was heard afar off; the admission of heathen strangers into the temple during Nehemiah's absence in Persia, and their summary expulsion after his return; his enforcement of the broken covenant to pay the tithes, to sanctify the Sabbath day, and to refrain from marriages with the heathen around them.

NEHLIG', VICTOR, b. Paris, 1830. His instructors in painting were Abel de Pujol, and Cogniet. After residing some time in Havana, Cuba, he removed to New York, where he gained a reputation by his pictures representing the romance and poetry of American history. In 1870 he was elected a member of the national academy of design. Among his best-known works are "Gertrude of Wyoming," "Hiawatha and Minnehaha," and "Pocahontas."

NEILGHER'RY (properly NILGIRI) **HILLS** (Skr. *nila*, blue, and *giri*, mountain), a remarkable group of mountains in the s. of Hindustan, entirely isolated, with the exception of a precipitous granite ridge, 15 m. in width, which connects it with the high table-land of Maisur on the north. Lat. 11°. 10′ to 11° 38′ n., long. 76° 30′ to 77° 10′. The shape of the group is that of a triangle, of which one side faces the district of Malabar on the west. Greatest length, about 40 m.; average breadth, about 15 miles. The base of the mountains is covered by a dense and unhealthy forest, swarming with wild animals, among which are the elephant and tiger; but in the higher regions of the hills wood is comparatively scanty. The surface of the group is undulating, rising, in the peak of Dodabetta, near the center, to the height of 8,760 ft., the greatest height, as yet ascertained, in India s. of the Himalayas. The hills for the most part consist of granite, covered often to the depth of upwards of 10 ft. by a richly productive black soil. There are several morasses yielding peat, which is used for fuel. The higher lands form a fine open grass country, covered with the vegetation of the temperate zone, and inhabited by a most remarkable tribe, the *Tudas* or *Toruvars* (herdsmen). This tribe numbers only about 2,000 persons. The men are tall and handsome, with Roman noses, fine teeth, and large expressive eyes; the women are singularly beautiful. Their religion is theism; they have no idols. Owing to their great elevation the Neilgherry hills have a delightfully cool climate, and are much resorted to on this account by invalided Europeans. The principal station, and the only place on the hills that deserves the name of a town, is Utakamand, situated in the center of the hills, at an elevation of 7,300 ft. above sea level. Its climate is cold and damp during the monsoon; at other times it is intensely dry, and the mean annual temperature is 58°.

NEILGHERRY NETTLE, *Girardinia Leschenaultii*, a plant of the natural order *urticeæ*, nearly allied to the true nettles, and possessing in a high degree the stinging power which is common in them. It is frequent on all the higher ranges of the Neilgherry hills. The bark yields a valuable fiber, which the natives obtain by first boiling the whole plant, to destroy its stinging properties, and then peeling the stalks. The fiber is of great delicacy and strength, and is worth £200 a ton in England. The cultivation of the plant is therefore thought likely to be remunerative.—Markham's *Travels*.

NEILL, THOMAS H., b. Penn., 1825; educated at West Point, and after graduating in 1847 was assigned to the infantry. At the outbreak of the rebellion he organized the 23d Penn. vols., and commanded the regiment in the peninsular campaign of 1862. The same year he was brevetted brig.gen., and at Fredericksburg, Marye heights, and Gettysburg commanded a brigade of the 6th corps. In 1864 he was made maj. with brevet rank of maj.gen. for gallant conduct at the siege of Petersburg and battle of Winchester. Since the end of the war he has been promoted to the rank of lieut.col., has been engaged in the Indian warfare, and in 1875 was made commandant of West Point.

NEI'RA. See MOLUCCAS.

NEIS'SÉ, a t. of Prussian Silesia, and a fortress of the second rank, is situated in a broad valley on the Neisse, an affluent of the Oder, 30 m. s.w. of Oppeln. It consists of the town proper on the right bank, of the Friedrich's town, and of the Preussen fort on the left bank. It contains two great squares, has eight Catholic and two Evangelical churches, a hospital, theater, etc. It carries on manufactures of arms, chemical products, and tobacco, and establishments for spinning and weaving are in operation. The entire pop. in 1871 was 19,376. Neissé, formerly the chief town of a principality of the same name, and the residence of a prince-bishop, has frequently been the scene of conflict.

NEJIN′, an ancient t. of Little Russia, in the government of Tchernigof, on the Oster, an affluent of the Dnieper, about 80 m. n.e. of Kiev. It fell into the hands of the Lithuanians in 1320, and of the Poles in 1386, but was annexed to Russia in 1654. Nejin is an industrious town of (1867) 20,516 inhabitants, many of whom are descendants of Greek immigrants who settled here in the reign of Catharine II. The principal branch of industry is the cultivation of tobacco. Great quantities of leaf tobacco are sent hence to St. Petersburg, Riga, and Mittau. The chief institutions are 2 monasteries, 25 churches, and a lyceum.

NÉLATON′, AUGUSTE, 1807–73; b. Paris; studied with Dupuytren, graduated in medicine in 1836, practiced surgery in several hospitals, and was adjunct professor of the faculty of Paris from 1839 to 1851, and professor of clinical surgery till 1867; became a senator in 1868; was member of the academy, and surgeon to Napoleon III.; made several improvements in surgery, one of which was for the extraction of stone of the bladder. A probe, having an unpolished porcelain knob at its end, much used in military surgery for reaching for lead bullets, is called Nelaton's probe. In conjunction with Velpeau he published *Rapport sur la Progrès de la Chirurgie* in 1867; but his principal work is *Elémens de Pathologie chirurgicale*, in 5 vols. 2d ed., 1867–70.

NE′LIGH, a co. in central Nebraska, drained by the Loup fork of the Platte river; 576 sq. miles. Its surface is adapted to stock-raising, but is very little cultivated.

NELLORE′, a t. of British India, capital of a district of the same name, in the presidency of Madras, situated on an elevation on the right bank of the northern Pennar, 20 m. from its mouth, and 95 m. n.n.w. from Madras. It is irregularly built, and the population in some places much crowded; but there are some good streets. The abundant supply of water contributes to the health of the town. Nellore was formerly an important fortress. It is a curious circumstance that, in the end of last century, a pot filled with Roman gold coins and medals—chiefly of Trajan, Adrian, and Faustina—was found under the ruins of a small Hindu temple at Nellore. Pop. '71, 29,922.

NELSON, a co. in central Kentucky, traversed by the Great Southern and the Louisville and Nashville railroads; drained by Salt river. Pop. 14,804—3,918 colored. The surface is slightly hilly and largely covered with forests, the soil fertile, good limestone being found in several parts. The principal products are lumber, grain, wool, and live stock. It has numerous saw-mills, 3 flour-mills, and 8 distilleries. Co. seat, Bardstown.

NELSON, a co. in central Virginia, extending from the Blue ridge on the n.w. to the James river on the s.e., and drained by the Tye and Rock rivers and Rockfish creek; crossed by the Washington City, Virginia Midland and Great Southern, and the Atlantic, Mississippi and Ohio railroads; and intersected by a canal leading to Richmond; 340 sq.m.; pop. '80, 16,535—7,512 colored. The soil is fertile, and the surface undulating, in some parts being covered with extensive forests. Wheat, Indian corn, oats, and tobacco are the leading products. Co. seat, Lovingston.

NELSON, the capital of a province of the same name, in New Zealand, is situated at the n. end of South island, at the mouth of the Maitai, a small river, and at the head of a large bay called Blind bay. The situation is very beautiful, on a flat, hemmed in by rugged hills and amidst almost tropical luxuriance. The harbor, however, only admits vessels of 500 tons at high water, and this circumstance has much retarded the progress both of the town and the settlement. The center of the town is a hill rising 40 ft. above the surrounding streets, and laid out as a square with an Episcopal church in its center. Nelson is the seat of a bishop. The city was founded in 1841. Pop. '71, 5,534; with suburbs (1877) about 10,000. Three newspapers are published here. The manufactures of the town comprise cloth and leather.

NELSON, DAVID, 1793–1844; b. Tenn.; graduated at Washington college, Va.; studied medicine in Danville, Ky., and in the Philadelphia medical school; returned to Kentucky at the age of 19, intending to practice his profession, but the war of 1812 having commenced, he joined a Kentucky regiment as a surgeon, and went to Canada. Returning he came near losing his life from hunger and fatigue, but was found and saved by his relative, col. Allen. He resumed his medical practice at Jonesborough, his native town. Religiously educated, he had early made a profession of religion, but while in the army he became an infidel. He soon, however, became convinced of the truth of the Bible, and determined to enter the ministry. He was licensed to preach in April, 1825. He preached three years in Tennessee, and published also at Rogersville the *Calvinistic Magazine*. In 1828 he succeeded his brother Samuel as pastor of the Presbyterian church in Danville, Ky. In 1830 he removed to Missouri and established Marion college, near Palmyra, of which he was the first president. Earnestly advocating the cause of emancipation he found it expedient to leave Missouri, and in 1836 he removed to Illinois, where he established at Oakland, near Quincy, a school for the education of young men for the ministry. He exhausted his pecuniary means and the institution failed. In 1836 he published a work of great interest—*Cause and Cure of Infidelity*—which had an extensive circulation and passed through several editions in America and England. He wrote a work entitled *Wealth and Honor*, but the manuscript was lost in passing from his hands. He wrote articles on missions, baptism, etc., for the *New York Observer* and other public journals.

NELSON, HORATIO, the greatest of Britain's admirals, was b. on Sept. 29, 1758, at Burnham Thorpe, Norfolk, of which place his father, Edmund Nelson, was rector. His mother's maiden name was Suckling, and through her he could claim a collateral kinship with the celebrated sir Robert Walpole. As a child he was feeble and sickly; and throughout life his small, frail, and attenuated frame seemed to consort but poorly with the daring and impetuous spirit which "stirred and lifted him to high attempts." At the age of 13 he entered the royal navy, commencing his career in the *Raisonnable*, 64 guns, commanded by his uncle, capt. Suckling. Then, even more than now, promotion in the first stages of the profession was determined by admiralty interest; and fortunately for him and for England, his uncle, shortly afterward becoming comptroller of the navy, was able to facilitate his rise. His promotion was nearly as rapid as it could be, and before he was quite 21 he had attained the rank of post-captain, which fairly opened the way for him to the higher honors of the service. Up to this time no opportunity had been afforded him of achieving any marked distinction, but to all who were brought into contact with him he had already approved himself a bold and capable officer. Henceforward, for some years, he was nearly constantly employed in a variety of harassing services; and in all, his conduct was such that in no long time he had made for himself a brilliant reputation. His growing fame was as yet, however, chiefly confined to professional circles, no very signal exploit having brought his name prominently before the public. But with the advent of the war with revolutionary France the time had come when he was to "flame amazement" on the world by a series of noble deeds, in the luster of which all other naval glory looks pale. In his obscurer years, he seems to have been cheered under what pained him as unmerited neglect by that prescience of a grand destiny, which has so often preluded to a career of exceptional splendor. Thus, on one occasion, he writes: "They have not done me justice. But never mind. One day I'll have a gazette of my own." And subsequently the same confidence is expressed with something like the depth of a religious conviction: "One day or other I will have a long gazette to myself. I *feel* that such an opportunity will be given me. I cannot, if I am in the field of glory, be kept out of sight; wherever there is anything to be done, *there Providence is sure to direct my steps.*" In 1793 appointed to the *Agamemnon*, 64 guns, he took a distinguished part, among other services, in the sieges of Bastia and Calvi, in Corsica, losing an eye at the last of these; and in the celebrated action of sir John Jervis off cape St. Vincent with the Spanish fleet, to a maneuver of extreme and masterly daring, executed by Nelson in defiance of orders, that officer was mainly indebted for the splendid success obtained, and the peerage with which it was rewarded. Though in the interval an expedition which he commanded against Teneriffe had failed disastrously, with loss to himself of his right arm in the assault, it was on all hands admitted that everything was done on the occasion which skill and valor in their highest combination could effect, and Nelson on his return to England in 1797, was received with general acclamation. He was invested with the order of the bath, and a pension of £1000 a year was voted to him. Being next year intrusted with a fleet, he signalized this his first independent command of any magnitude by the stupendous victory of the Nile, memorable in naval annals as the completest annihilation of an enemy on record. See ABOUKIR. Finding the French fleet—to which his own was considerably inferior in force—skillfully moored so as to defy ordinary attack, he adopted the novel expedient of doubling on the enemy's ships, and was rewarded with success the most consummate. Of the French line of battle, two ships only escaped to be afterward captured; and it was considered that solely to a wound in the head, which in the heat of the action prostrated Nelson, did even these owe their temporary safety. Honors were now from all quarters showered upon him; and in particular the gratitude and enthusiasm of his countrymen were signified by the title bestowed on him of baron Nelson of the Nile, and a grant of £2000 a year for his own life, and the lives of his two immediate successors. For his services immediately subsequent, in effecting the expulsion of the French from Naples, the Neapolitan king rewarded him with the dukedom of Bronte and a domain of £3000 a year. These last honors, however, were in one sense dearly purchased. The single suspicion of a blot on his public fame is in regard of his relations with the corrupt court of Naples, and of certain questionable acts into which by these he was led. The only flaw in his private character was his infatuated attachment to lady Hamilton, the wife of the English ambassador, a woman of questionable antecedents, but perilous fascination, with whom he was here thrown in contact. The influence which she now obtained over him, she continued to the end to exercise. Early in life he had married, and married happily. If to the charms of an impure adventuress he sacrificed, on his return to England, the wife to whom before he had been tenderly devoted, it is not necessary to indulge in comment. Let us compassionate the one cruel frailty of a man in all else and in his proper nature, as gentle and generous as he was brave.

His next magnificent exploit was the battle of Copenhagen in 1801, in which, after a struggle of terrible severity, he shattered the naval power of Denmark, and along with it the dreaded coalition against England of the three northern kingdoms. Never were the characteristic and heroic qualities of the man more brilliantly displayed than on this most trying occasion. In the moral courage to accept responsibility at all hazards, no man ever surpassed him. In the heat of the battle, his chief, sir Hyde Parker, in deadly anxiety as to the issue of what at a distance seemed to be a hopeless conflict, signaled him to discontinue action. "Damn the signal!" said Nelson, when this was reported to him. "*Keep mine for closer battle flying.* That's the way I answer such signals. Nail mine to the mast." And with the certainty of professional disgrace and ruin staring him in the face in case of failure, he worked out his grand triumph.

Had Nelson's services here ceased, his fame would still have been assured as the greatest of England's naval heroes. But a crowning glory awaited him. In the earlier part of 1805, glowing with fierce ardor and impatience, he had chased half round the world a French fleet of nearly double the force of his own, scared by the very terror of his name; and on the morning of the memorable Oct. 21 of that year, the desire of his eyes was satisfied, when in the bay of Trafalgar he saw before him the combined navies of France and Spain moving to meet him in frank fight. Of the glorious consummation which followed we need not speak in detail. Ere night, the power of France upon the seas was annihilated, and her threatened invasion of England had become an abortive dream. But Nelson was no more. He died as such men wish to die, amid the thunders of his mightiest victory.

The character of Nelson was, for a man of his greatness, unusually simple and transparent. A more absolute singleness of aim and aspiration than his it is difficult even to conceive of. Literally on fire with that ardor and passion of enthusiasm without some tincture of which scarce any man perhaps has ever yet achieved distinction, he was driven by it imperiously in one direction. The greatest of sailors—he was a sailor and little else. Of his genius for command it would be idle at large to speak. In coolness, foresight, promptitude, instant intuitive decision, and a daring which, even when it seemed at times to touch temerity, was yet regulated throughout by the nicest calculations of reason, he has perhaps never been quite equaled on the element. His nature was most noble and humane. His heart was as soft as a woman's, and overflowed with all liberal generosities. He had but to be known to be beloved; and of the tender chivalry of his relations with his gallant brethren in arms it is touching to read.

NELSON, **Samuel**, LL.D., 1792–1873; b. N. Y.; educated at Middlebury college, and admitted to the bar in 1817. He was a presidential elector for New York in 1820, and a circuit judge 1823–31. In 1844 he was appointed an associate justice of the state supreme court, which office he retained till 1872. He was a member of the N. Y. constitutional convention in 1846, and of the joint high commission for the settlement of the Alabama claims in 1871.

NELSON, **Thomas**, 1738–89; b. Va.; son of William Nelson, president of the Virginia colonial council. He was educated at Trinity college, Cambridge, England. Returning to this country in 1761, he took up his residence at Yorktown on the family estates. In the disputes with Great Britain he warmly advocated the colonial cause, both privately and in the house of burgesses. He served in the first provincial convention of 1774, and in the second of 1775. In the latter year he became col. of the 2d Va. regiment, but resigned in 1776 upon his election to the constitutional convention. In this body he introduced a resolution instructing the Va. congressional delegation to bring before congress proposals for a declaration of independence. He was elected to congress in time to sign the declaration, but resigned in May, 1777, on account of ill-health. In August of the same year, when a British squadron under admiral Howe was off the Virginia coast, he became commander-in-chief of the state troops, and soon after, at the call of congress, led a cavalry battalion to Philadelphia. After the alarm occasioned by the approach of Howe had subsided, he returned to the legislature, where he resisted the proposed confiscation of British property, maintaining that it was unjust to make private persons suffer for public wrongs. Early in 1779 he was again a member of congress, and was again forced by ill-health to resign. In May the same year, he organized the state militia, for protection against a British foraging and plundering expedition then invading Virginia. In 1780, when congress had asked for contributions to pay for the expenses of the French contingent, Virginia attempted to raise a loan of $2,000,000. In the depreciated condition of the public credit, there was little hope of negotiating that sum, but a large amount was advanced by Nelson, who made himself personally responsible. He also paid two Virginia regiments, which had refused to go south till they had received the arrearages of their pay. In 1781 he succeeded Jefferson as governor. The British were ravaging the state, and Nelson opposed them with what militia he could muster. He was forced to exercise extra legal powers, but his acts were afterward sanctioned by the legislature. In command of the state militia at the siege of Yorktown, he ordered the bombardment of his own house, the most valuable in the town. He was already financially embarrassed by his loans to the government, and in his last days his property was sold to pay his debts. He resigned in Nov., 1781.

NELSON, **William**, 1825–62; b. Ky.; brother of Thomas Henry, minister to Chili 1861–66; joined the navy in 1840, and in 1847 commanded a battery in the fleet which bombarded Vera Cruz, keeping up a continuous cannonade and seconding the movements of the army under Scott, resulting in the capture of the city and fort. He served in the Mediterranean and south Pacific, and in 1854 was promoted to master, in 1855 to lieut. In 1858, when the slave ship *Echo* was required to discharge her cargo of negroes into the keeping of the *Niagara*, for the purpose of restoring them to African soil, he was ordered to the latter vessel. In 1861 he was on ordnance duty at Washington, and at the outbreak of the rebellion he was placed in command of the gunboats on the Ohio, with the rank of lieut.commander. Soon after, he left the navy, and entering the military service, was ordered to Kentucky. He there established recruiting stations, and organized camp "Dick Robinson," near Danville, and a similar rendezvous at Washington, in Mason county He was promoted to brig.gen. Sept. 1861. At the battle of Shiloh, April, 1862, he commanded the 2d division under gen. Buell, whose forces united with gen. Grant's were attacked by the confederate gen. Beauregard. He was wounded at the battle of Richmond, Ky. In 1862, when Louisville was threatened with an attack of the confederates under gen. Bragg, he commanded the union forces, ordered earthworks to be constructed, pressing private citizens into the service, and defending the position until the arrival of gen. Buell with the army. In 1862 he was commissioned maj.gen. of volunteers, and in September was fatally shot at the Galt house, Louisville, by the union gen. Jefferson C. Davis of Indiana, in a personal quarrel.

NELSON, **Wolfred**, 1792–1863; b. Montreal; son of an English officer; in 1811 he began the practice of medicine in St. Denis. In the war with the United States, 1812, he served as surgeon. He was chosen representative of Sorel in the Canadian parliament of 1827. In the revolution of 1837 he was prominent, and was in command at the victory obtained by the insurgents at St. Denis, on the Richelieu river, but was captured and sent to Bermuda as an exile. In the next year he settled at Plattsburg, N. Y., and in 1842 returned to Montreal, a general amnesty having been declared. He was again elected to parliament from his former district in 1844 and 1845, and in 1851 was made inspector of prisons, a position which he held for several years. He served as mayor of

Montreal two terms and was at the head of the Lower Canada college of physicians and surgeons.

NELSON RIVER, British North America, rising in the n. extremity of lake Winnipeg in the North-West territory, a branch of the Saskatchawan, after passing through a number of lakes runs n.e. into Hudson's bay, where it is sometimes called Katchawan. It is deep, wide, and swift, and in its course makes many abrupt turns, and has many rapids and falls that render it almost unnavigable. That part of the area e. of the lake of the Woods and lake Winnipeg, is a rough country with a soil of Laurentian formation except for 100 m. of the river's course through the Silurian plain of Hudson's bay. In the former region one-quarter is arable land, about one-half is too cold for cultivation, and about 70,000 sq.m. of timber constitute the remainder. The area of its basin is 432,000 sq.miles. West of lake Winnipeg it traverses a fertile country adapted to wheat culture. Its length to the head of the south fork of the Saskatchawan is 1732 m.. and at its mouth is York, a town and fort, one of the principal trading-posts of the Hudson's bay fur company.

NELUM'BO, *Nelumbium*, a genus of aquatic plants similar to water-lilies, and often included under that name, as well as by some botanists in the natural order *nymphæaceæ* (q.v.); although by others constituted into a distinct order, *nelumbiaceæ*, differing in the want of albumen in the seed, and in the distinct carpels, which are one-seeded, and buried in the cavities of a large fleshy receptacle; which eventually becomes a broad hard bed, full of holes, with the large seeds half buried in them. The flowers and leaves are very similar to those of water-lilies. The species are few, and are found in the warm parts of Asia, in the n. of Africa, and in North America. They are all distinguished by the beauty of their flowers. *N. speciosum* is the EGYPTIAN BEAN of Pythagoras, the *lotus* (q.v.) of the Hindus, held sacred by them and by the people of Thibet. It is also much esteemed and cultivated in China, and elsewhere in the e., for its seeds, roots, leaf-stalks, and flower-stalks, all of which are eaten. It has been used as food by the Egyptians from remote antiquity. The seeds are in size and shape like acorns, with a taste more delicate that that of almonds. The root contains much starch, and *Chinese arrowroot* is said to be obtained from it. Slices of it are often served up at table in China. Great quantities are pickled with salt and vinegar, and eaten with rice. The powdered root makes excellent soup with water or milk. The flowers are generally rose-colored, seldom white. The ancient Egyptian mode of sowing this plant, by inclosing each seed in a ball of clay and throwing it into the water, is practiced at the present day in India.—*N. luteum* is a North American species, extending almost as far north as Philadelphia; with yellow flowers The seeds are sought after by children and by Indians, and the farinaceous roots are agreeable when boiled.

NE'MAHA, a co. in n.e. Kansas, having the state line of Nebraska for its n. boundary, drained by the Nemaha and Delaware rivers and by Vermilion creek; 720 sq.m.: pop. '80, 12,463—10,727 of American birth, 75 colored. It is intersected in the s. by the central branch of the Union Pacific railroad and centrally by the St. Joseph and Denver City railroad. Its surface is somewhat hilly and its soil is very fertile, producing large crops of wheat, corn, oats, potatoes, and dairy products. It is a fine country for stock-raising, and its rivers furnish excellent water-power. Its mineral products are limestone, much used for building-purposes, sandstone, coal, and gypsum. It has for that section a good supply of timber, appearing along the streams, and on the bluffs, in groves of oak, hickory, walnut, and cotton-wood. Co. seat, Seneca Court House.

NE'MAHA, a co. in s.e. Nebraska, having the Missouri river for its e. boundary separating it from Missouri; intersected by the Nebraska railway in the s. and centrally by the Brownville to Aurora branch; 420 sq.m.; pop. '80, 10,451—9,256 of American birth. Its surface is hilly and drained by the Little Nemaha river, Muddy creek, and other small streams. A large proportion is prairie land with groves of ash, elm, cottonwood, and hickory, which grow along the river bottoms where the soil is fertile, having a limestone foundation, and producing the staple products of the western states. It is eminently fitted for stock-raising. Limestone, found in abundance, is used for building-purposes, and coal is mined. Co. seat, Brownville.

NEMATEL'MIA (derived from the Gr. words *nema* a thread, and *helmins*, an intestinal worm), is the term given by recent zoologists to a large and important class of the subdivision *vermes* of the *articulata*. The worms belonging to this class are of a more or less elongated cylindrical form. Their skin is thick and strong, and is usually wrinkled in such a manner as to give the body an annulated appearance, which, however, disappears if the animal is placed in water. The nervous system in the higher forms (as the *ascaridæ*) consists of two lateral ganglia at the anterior extremity, which are united by a slender nervous ring, and from which two lateral nervous trunks proceed to the posterior part of the body; while in the lower forms no distinct nervous system can be recognized. No special organs of the senses are met with; but a general sense of touch is probably present. The digestive organs are extremely simple. In one order (the *acanthocephala*) no trace of an intestinal canal can be detected: in another order (the *gordiacea*), there is a mouth, but no anus; while the higher forms are provided with mouth, intestinal canal, and anus In the higher forms, a kind of vascular system is developed in the skin, in the shape of canals, in which the nutrient fluid is propelled by the movements of the body. No distinct respiratory organs can be detected; but in some genera there are glands whose object is not clearly known. These worms are unisexual; but the males are comparatively rarely found, and are always smaller than the females. With the exception of two families—the *urolabea* and *anguillulidæ*, or paste and vinegar eels—all the animals of this class are parasitic; indeed, Carus, in his *Handbuch der Zoologie* (1863), vol. ii. p. 458, goes so far as to say that "probably all the nematelmia live as parasites, either during their whole lives or during certain stages of their existence."

The nematelmia are sometimes termed *round-worms*, just as the platyelmia (tape-worms, flukes, etc.) are called *flat-worms*. Most commonly, however, the term round-worm is restricted to the *ascaris lumbricoides*, the most common of the human entozoa.

This class is divisible into three very distinct orders—viz., the *acanthocephala*, which are destitute of an intestinal canal; the *gordiacea*, which possess an intestinal canal, but no anus; and the *nematoidea*, which possess a perfect intestinal canal, provided with two orifices.

NEMATOI'DEA constitute the highest order of the nematelmia, and indeed of intestinal worms generally, inasmuch as they present a distinct nervous system, a complete intestine provided with mouth and anus, and distinct sexual organs. The history of their development is not fully known; but there is no reason to believe that these animals undergo any remarkable metamorphoses, although some perforate the intestinal walls, and become encysted in parenchymatous organs. The great majority of the nematoidea are parasitic. The nematoidea are divided by Carus into twelve families, all the members of which are known only in a parasitic state of existence, excepting certain genera of the first and second family.

Although the intestinal canal is the most common residence of these worms, some, as *trichina spiralis*, are found chiefly in the muscles; others, as *filaria medinensis*, in the subcutaneous cellular tissue, and others in the kidneys, lungs, etc. See Entozoa. For further information regarding these worms, the reader is referred to Eberth's *Untersuchungen uber Nematoden* (4to, 1863).

NE'MEA, anciently the name of a deep and well-watered valley of Argolis, in the Peloponnesus, between Cleonæ and Phlius. It lies n. and s., and is from 2 to 3 m. long, and more than half a mile broad. It possessed a sacred grove, with a magnificent temple of Zeus, and was celebrated for the games called the *Nemean games*, which took place four times in two olympiads in an adjacent woody valley. This was one of the great national festivals of the Greeks, and, according to one legend, was founded by the seven princes who were combined against Thebes: according to another, by Hercules after his victory over the Nemean lion. The games consisted partly of exercises of bodily skill and strength—such as chariot-racing, quoit-throwing, wrestling, running in armor, horse-racing, boxing, throwing the spear, and archery, and partly of musical and poetical competitions. The prize was originally a crown of olive twigs, afterwards of parsley. We have eleven odes by Pindar in honor of victors in the Nemean games.

NEMER'TÉS, a genus of marine *annelida*, the type of a family, *nemertidæ*, remarkable for the prodigious length which some of the species attain, which, in their most extended state, is 30 or 40 feet. But the animal which stretches itself out to this length, is capable of suddenly contracting itself to 3 or 4 feet. The structure is similar to that of leeches, but there is no sucker. These annelids feed upon molluscs by sucking them out of their shells. They generally lurk in the mud or sand of the sea-coast, and are sometimes drawn up with the nets or lines of fishermen. They twine themselves into knots and coils, apparently inextricable, but without any real entanglement. The life history of the *nemertidæ* is curious. The embryo has at first a ciliated, non-contractile, oval body; from which there issues a small actively contractile worm, leaving behind it the oval skin, and this worm grows to the size already mentioned. The larval state, however, exhibits a cleft with raised edges, which becomes the mouth of the perfect animal.

NEMESIA'NUS, Marcus Aurelius Olympius, b. about the middle of the 3d c., probably in Africa. He wrote four eclogues, and a poem on hunting.

NEM'ESIS, according to Hesiod, the daughter of Night, was originally the personification of the moral feeling of right and a just fear of criminal actions—in other words, of the conscience. Afterwards, when an enlarged experience convinced men that a divine will found room for its activity amid the little occurrences of human life, Nemesis came to be regarded as the power who constantly preserves or restores the moral equilibrium of earthly affairs—preventing mortals from reaching that excessive prosperity which would lead them to forget the reverence due to the immortal gods, or visiting them with wholesome calamities in the midst of their happiness. Hence originated the latest and loftiest conception of Nemesis, as the being to whom was intrusted the execution of the decrees of a strict retributive providence—the awful and mysterious avenger of wrong, who punishes and humbles haughty evil-doers in particular. Nemesis was thus regarded as allied to Até (q.v.) and the Eumenides (q.v.). She was sometimes called Adrastēa and Rhamnusia, the latter designation being derived from Rhamnus, a village of Attica, where she had a temple. She was represented in the older times as a young virgin, resembling Venus; in later times, as clothed with the tunic and peplus, sometimes with swords in her hands and a wheel at her foot, a griffin also having his right paw upon the wheel; sometimes in a chariot drawn by griffins. Nemesis is a frequent figure on coins and gems.

NEME'SIUS, b. Syria about the middle of the 4th c.; bishop of Emessa in the reign of Theodosius the great, though the time is uncertain, and little is known about his life. He left a treatise in Greek on *The Nature of Man*, which treats of the soul and body. The observations and theories of Nemesius on the latter subject show considerable ingenuity and learning. His description of the glands, nerves, and spleen show him to have been thoroughly acquainted with the physiological learning of his time; and, in regard to the motion of the pulse and the object of the bile, have given rise to the supposition that he was acquainted with the circulation of the blood and the functions of the bile and liver. In regard to the motion of the pulse, he says: "It takes its rise from the heart, and chiefly from the left ventricle of it; the artery is with great vehemence dilated and contracted, by a sort of constant harmony and order. While it is dilated, it draws with force the thinner part of the blood from the next veins." The soul was considered by Nemesius as formed of two parts: the rational part, composed of will, memory, and thought; and the irrational part, consisting of the passions and desires. He believed in the Platonic teaching as to the pre-existence of the soul.

NEMI, a lake in Italy, having on its margin a temple of Diana famous among antiquities. It was called Speculum Dianæ, mirror of Diana, and is now known as Lago di Nemi. It is 17 m. s.e. of Rome. The ancient estimate of the distance from the temple to La Riccia (their Aricia), a city of Latium, is 3 m.; and the place was celebrated throughout Italy on account of its sacred temple, grove and lake, and given the surname of Nemoralis. The n.e. margin is the site of the ancient town of Nemus now occupied by the village of Nemi overlooked by a feudal castle. It is less than 6 m. in circumference, lying between lake Albano and the town of Velletri, on the Appian Way, in the midst of steep high hills, embowered in trees, once peopled with votaries of Diana. It fills the crater of an extinct volcano and has no known outlet except a passage made by the ancients which still serves its original purpose. It is a favorite resort for tourists and artists.

NEMOURS, LOUIS CHARLES PHILIPPE RAPHAEL D'ORLÉANS, Duc de, b. Paris 1814; 2nd son of Louis Philippe. In 1831 he was elected king of the Belgians, but declined. as he did a subsequent offer of the throne of Greece. He served in the two Belgian campaigns, and in Algeria, and was made lieut.general. After the death of his elder brother. the duc d'Orléans, a bill was passed conferring the regency upon the duc de Nemours; but it was not sanctioned by public opinion, and he left France in 1848, and did not return till 1870. He married in 1840 Victoire-Auguste-Antoinette, duchess of Saxe-Coburg, by whom he has 2 sons and 2 daughters.

NE'NAGH, a market t. of Tipperary co., Ireland, distant 95 m. s.w. from Dublin; pop. '71, 5,696, of whom the Roman Catholics were twelve times as many as the Protestants of the Episcopalian church, and there were fifty or sixty Protestants of other denominations. Nenagh is the assize town of the North Riding of Tipperary, and is a place of more than ordinary pretensions in its public buildings. The ancient keep, called Nenagh Round, is a striking object, and the court-house, jail, barrack, and union workhouse are imposing edifices. There is a free school, and three national schools. Among the not very numerous articles manufactured at Nenagh, are woolens, tobacco, soap, and candles. It is, however, a place of very considerable inland trade.

NENA SAHIB. See NANA SAHIB, *ante.*

NENNIUS, a monk of Bangor, in Wales, who is believed to have lived early in the 9th century. Others, but without authority, place him in the early part of the 7th century. He calls himself, in his history, a Briton, and not a Saxon, and a pupil of bishop Elbodus, or Elvodug. He is known only from the history of Britain ascribed to him, *Historia Britonum,* or *Eulogium Britanniæ.* The work begins with a mythical genealogy of Brut, grandson of Æneas, and first king of Britain. After a description of the Pictish emigration to n. Britain, and the Scottish settlement of Ireland, and a brief account of the Roman conquest and rule in Britain, he treats of the Anglo-Saxon invasion and conquest down to 655. The author says at the beginning that the work was compiled "from the annals of the Romans, and the chronicles of the fathers, from the writings of the Scots and Angli, and the traditions of our ancestors." His book is confused and often untrustworthy. Its chief value is the collection of legends contained in it, such as those of king Arthur and Merlin. It is in dispute, indeed, if Nennius ever lived, and if the history which bears his name be not a later forgery. The name of Nennius was not connected with it till the 13th century. The manuscript contains many interpolations, the work of a copyist who admits that he omitted portions of the work of Nennius, and added passages of his own.

NEOLOGY, a term signifying new doctrine or new statement, and first used in Germany about the middle of the 18th c. to denote the new statement of Christian doctrine and new explanations of biblical facts which, in their developments, became widely known as rationalism. The Neologists at first, professing to regard Christianity as an inestimable blessing to men and the Scriptures as the rule of faith, proceeded to explain the doctrines of the former and the facts of the latter according to what they called the increasing intelligence supplied by education and culture. Without affirming that anything in the Bible was false, they asserted that many things in it had been misunderstood. Without assailing the historical character of the miracles they attributed them entirely to natural powers and means. Beginning with explaining away the less important facts, they gradually applied the same process to the most vital doctrines. Thus, students of the Bible and of theology, as well as congregations and the people generally, were prepared for the absolute "rationalism" which denies a special divine revelation in the Bible. See RATIONALISM.

NE'OPHYTE (Gr. *neophutos*, from *neos*, new, and *phuo*, to grow), the name given in early ecclesiastical language to persons recently converted to Christianity. The word is used in this sense by St. Paul (1 Tim. iii. 6), and is explained by St. Gregory the great as an allusion to "their being newly planted in the faith" (Epp. b. v. ep. 51). It differed from catechumen (q.v.), inasmuch as it supposed the person to have not only embraced the doctrines of the church, but also to have received baptism. St. Paul, in the passage referred to, directs Timothy not to promote a neophyte to the episcopate; and this prohibition was generally maintained, although occasionally disregarded in very extraordinary circumstances, such as those of St. Ambrose (q.v.). The duration of this exclusion was left for a time to the discretion of bishops; but several of the ancient synods legislated regarding it. The third council of Arles, 524, and the third of Orange in 538, fix a year as the least limit of probation. In the modern Roman Catholic church the same discipline is observed, and extends to persons converted not alone from heathenism, but from any sect of Christians separated from the communion of Rome. The time, however, is left to be determined by circumstances. The name neophyte is also applied in Roman usage to *newly ordained priests*, and sometimes, though more rarely, to the *novices* of a religious order.

NEOPLA'TONISTS, the name given to an illustrious succession of ancient philosophers who claim to found their doctrines and speculations on those of Plato. Strictly speaking, however, the Platonic philosophy—that is, in its original and genuine form—expired with Plato's immediate disciples, Speusippus and Xenocrates. Arcesilaus (q.v.), the founder of the new academy, and at a later period Carneades (q.v.), introduced and diffused a skeptical *Probabilism*, which gradually destroyed that earnest and reverent spirit of intellectual inquiry so characteristic of the great pupil of Socrates. The course of political events in the ancient world also largely assisted in bringing about the same result. The triumphs of the Roman power had been accomplished at the expense of national liberties, and had issued in a general deterioration of moral character, both in the east and the west. Public men, especially, sought, above all things, material gratifications, and came to look upon philosophy itself as only a more exquisite kind of luxury. It was quite natural, therefore, that skepticism and eclecticism should become the prevalent forms of philosophy. Besides, the speculations of the older philosophers were felt to be unsatisfactory. When men began to review the long succession of contradictory or divergent systems that had prevailed since the time of Thales the Milesian, in the gray dawn of Greek history, a suspicion appears to have sprung up that reality, certainty, truth, was either not attainable, or could only be attained by selecting something from every system. Moreover, the immensely extended intercourse of nations, itself a result of Roman conquest, had brought into the closest proximity a crowd of conflicting opinions, beliefs, and practices, which could not help occasionally undergoing a confused amalgamation, and in this way presented to view a practical eclecticism, less refined and philosophical indeed than the speculative systems of the day, but not essentially different from them. This tendency to amalgamation showed itself most prominently in Alexandria. Placed at the junction of two continents, Asia and Africa, and close to the most cultivated and intellectual regions of Europe, that celebrated city naturally became a focus for the chief religions and philosophies of the ancient world. Here, the east and the west, Greek culture and oriental enthusiasm, met and mingled; and here, too, Christianity sought a home, and strove to quell, by the liberality of its sympathies, the myriad discords of paganism. "Greek skepticism," says Mr. Lewes, "Judaism, Platonism, Christianity—all had their interpreters within a small distance of the temple of Serapis." It is not wonderful, therefore, that a philosophy, which so distinctly combines the peculiar mental characteristics of the east and the west, as that promulgated by the Neoplatonists, should have originated in Alexandria. Yet, at the same time, it is but right to notice, as does M. Matter in his *Histoire de l'Ecole d'Alexandrie*, that it soon ceased to have any local connection with the city. Its most illustrious representatives were neither natives of Alexandria, nor members of the famous museum, and they had their schools elsewhere—in Rome, in Athens, and in Asia.

It is not easy to say with whom *Neoplatonism* commenced. Scholars differ as to how much should be included under that term.* By some it is used to designate the whole new intellectual movement proceeding from Alexandria, comprising, in this broad view, the philosophy, 1st, of Philo-Judæus and of Numenius the Syrian; 2d, of the Christian fathers (Clemens Alexandrinus, Origen, etc.); 3d, of the gnostics; and 4th, of Ammonius Saccas and his successors. Others, again, would exclude the second of these (though the Alexandrian divines frequently Platonize); while a third party is disposed to restrict the application of the term to the fourth. The last of these modes of regarding Neoplatonism is the one most current, and is perhaps the most convenient and definite: yet Bouterwek, Tennemann, Lewes, etc., agree in considering Philo-Judæus (q.v.) an Alexandrian Jew, and (in part) contemporary of Jesus Christ, as the first of the Neoplatonists—that is to say, as the first who endeavored to unite the mysteries of oriental belief with the dialectics and speculations of the Platonists. A similar course was at least partially pursued by the Christian fathers of Alexandria, partly from a predilection for the philosophy in which they had been reared, and partly from a desire to harmonize reason and faith, and to make their religion acceptable to thoughtful and educated pagans; hence, they too may, not without reason, be classed along with Philo, though their spirit and aim are distinctively and even strongly Christian. In gnosticism, on the other hand, speaking generally, the lawless mysticism of the east predominated, and we see little either of the spirit or logic of Plato. They may, therefore, be dismissed from the category of Neoplatonists. Regarding Philo-Judæus and the Alexandrian divines, it must be noticed that they wrote and taught in the interests of their own religion, and had no idea of defending or propagating a heathen philosophy. It is this which strikingly distinguishes them from the school founded by Ammonius Saccas, and also from an independent group of pagan teachers and authors who likewise flourished in the first and second centuries after Christ, and whose main object was to popularize and diffuse the ethics and religio-philosophic system of Plato, by allegorically explaining the ancient mysteries of the popular belief in harmony with the ideas of their master, but, at the same time, blending with these many Pythagorean and Aristotelian notions. The best-known names of this group are Plutarch (q.v.) and Appuleius (q.v.). These men have a better claim to the title of Neoplatonists than any of the others. They adhered far more closely to their great master, and were, in fact—to the best of their ability—simply popular expounders of his philosophy. Living at a time when paganism was in a moribund condition, they sought to revive, purify, and elevate the faith in which their fathers had lived. Christianity, a young, vigorous, and hostile system, was rooting itself in the hearts of men deeper and deeper every day, and these disciples of Plato—tenderly attached to their ancestral religion—felt that something must be done to preserve from going out the fires that were feebly burning on the altars of the ancient gods.

But these commentators and expositors of Plato were not remarkable for their philosophical power; a fresh stream of life was first poured into the old channels of Platonic speculation by Ammonius Saccas (q.v.) and Plotinus (q.v.), and it is this fact which gives the school which they established its best claim to the exclusive title of *Neoplatonist.* "In no species of grandeur was the Alexandrian school deficient," as M. Saisset justly observes: "genius, power, and duration have consecrated it. Reanimating during an epoch of decline the fecundity of an aged civilization, it created a whole family of illustrious names. Plotinus, its real founder, resuscitated Plato; Proclus gave the world another Aristotle; and in the person of Julian the apostate, it became master of the world. For three centuries it was a formidable rival to the greatest power that ever appeared on earth—the power of Christianity; and if it succumbed in the struggle, it only fell with the civilization of which it had been the last rampart" (Lewes's *Biog. Hist. Phil.* p. 259). The essence of *all* the Alexandrian speculations, we have stated, consists in the blending of Platonic ideas with oriental mysticism; the peculiarity of the *Neoplatonists*, strictly so-called, lies simply in the novelty, audacity, and ingenuity of their reasonings. They aimed at constructing a religion on a basis of dialectics. They strove to attain a knowledge of the highest, and the way in which they endeavored to accomplish this was by assuming the existence of a capacity in man for passing beyond the limits of his personality, and acquiring an intuitive knowledge of the absolute, the true—that which is beyond and above the fluctuations and dubieties of "opinion." This impersonal faculty is called *ecstasy*. By means of it, man—ceasing, however, it should be observed, to be individual man, i.e., *himself*—can identify himself with the absolute (or infinite). Plotinus, in fact, set out from the belief that "philosophy" (i.e., "absolute truth") is only possible through the identity of the thinker, or rather of the subjective thought, with the thing thought of, or the objective thought. This intuitive grasp or "vision" of the absolute is not constant; we can neither force nor retain it by an effort of will; it springs from a divine inspiration and enthusiasm, higher and purer than that of poet or prophet, and is the choicest "gift of God."

The god of Plotinus and the other Alexandrians is a mystical trinity, in the exposition of which they display a dialectical subtlety that even the most ingenious of the schoolmen never reached. The divine nature contains within it three hypostases (substances); its basis, if we may so speak, is called unity, also poetically primitive light, etc. This unity is not itself any *thing*, but the principle of all things; it is absolute good, absolute perfection; and though utterly incapable of being conceived by the understanding, there is that in man that assures him that it—the incomprehensible, the ineffable, *is*. "It has neither quantity nor quality; neither reason nor soul; it exists neither in motion nor repose; neither in space nor time; it is not a numeric unity nor a point; . . . . it is pure esse without accident; . . . . it is exempt from all want or dependency, as well as from all thought or will; it is not a thinking being, but thought itself—the principle and cause of all things." To the skeptic this "primitive light," we are afraid, will not seem very luminous. From "unity," as the primordial source of all things, emanates "pure intelligence" (*nous*—the *vernunft* of modern German metaphysics); its reflection and image, that by which it is intuitively apprehended; from pure intelligence, in turn, emanates the "soul of the world" (*psyche tou pantos*), whose creative activity produces the souls of men and animals, and "nature·" and finally, from nature proceeds "matter," which, however, is subjected by Plotinus to such refinement of definition that it loses all its grossness. Unity, pure intelligence, and the world-soul thus constitute the Plotinian triad, with which is connected, as we have seen, the doctrine of an eternal emanation, the necessity of which he endeavors to demonstrate by the most stringent logic. Human souls, whose source is the pure intelligence, are—by some mysterious fate—imprisoned here in perishable bodies, and the higher sort are ever striving to reascend to their original home. So Plotinus, when in the agonies of death, said calmly to his friends: "I am struggling to liberate the divinity within me."

The most distinguished pupil of Plotinus was Porphyrius (q.v.), who mainly devoted himself to expounding and qualifying the philosophy of his master. In him we see, for the first time, the presence of a distinctively antichristian tendency. Neoplatonism, which can only be properly understood when we regard it as an attempt to place paganism on a philosophical basis—to make the Greek religion philosophical, and Greek philosophy religious—did not *consciously* set out as the antagonist of Christianity. Neither Ammonius Saccas nor Plotinus assailed the new faith; but as the latter continued to grow, and to attract many of the most powerful intellects of the age into its service, this latent antipathy began to show itself. Porphyry wrote against it; Iamblichus (q.v.), the most noted of his pupils, did the same. The latter also introduced a theurgic or "magical" element into Neoplatonism, teaching, among other things, that certain mysterious practices and symbols exercised a supernatural influence over the divinities, and made them grant our desires. Magic is always popular, and it is therefore not wonderful that Iamblichus should have had numerous followers. Ædesius succeeded to his master's chair, and appears to have had also a considerable number of disciples. To the school of one of them the emperor Julian belonged, whose patronage for a moment shed a gleam of splendor over Neoplatonism, and seemed to promise it a universal victory. After a succession of able but not always consistent teachers, we reach Proclus (q.v.), the last great Neoplatonist, who belongs to the 5th c., a man of prodigious learning, and of an enthusiastic temperament, in whom the pagan-religious, and consequently antichristian, tendency of the Neoplatonic philosophy culminated. His ontology was based on the Triad of Plotinus, but was considerably modified in detail; he exalted "faith" above "science" as a means of reaching the absolute unity; was a believer in Theurgy, and so naturally laid great stress upon the ancient Chaldean oracles, Orphic hymns, mysteries, etc., which he regarded as divine revelations, and of which he considered himself—as, indeed, he was—the last great "interpreter." His hostility to the Christian religion was keen; in its success he saw only the triumph of a vulgar popular superstition over the refined and beautiful theories of philosophy; it was as if he beheld a horde of barbarians defacing the statues and records of the Pantheon. The disciples of Proclus were pretty numerous, but not remarkable for high talent. Perhaps the ablest of his successors was Damascius, in whose time the emperor Justinian, by an arbitrary decree, closed the schools of the heathen philosophers. "The victims," says Cousin (*Cours d'Histoire de la Philosophie Moderne*), "of fierce retaliation, and of an obstinate persecution, these poor Alexandrians, after having sought an asylum in their dear east, at the court of Chosroes, returned to Europe (533 A.D.), were dispersed over the face of the earth, and the most part extinguished in the deserts of Egypt, which were converted for them into a philosophic Thebais." See Fichte, *De Philosophiæ Novæ Platonicæ Origine* (Berl. 1818); Bouterwek. *Philosophorum Alexandrinorum ac Neo-Platonicorum, recensio Accuratior* (Gött. 1821); Matter, *Essai Historique sur l'Ecole d'Alexandrie* (2 vols. Par. 1820); Simon, *Histoire de l'Ecole d' Alexandrie* (2 vols. Par. 1845); Barthélemy St. Hilaire, *De l'Ecole d'Alexandrie* (Par. 1845); Lewes, *Biographical History of Philosophy* (1857); and Ueberweg's *History of Philosophy* (Translation, Hodder and Stoughton: 1872).

NEO'SHO, a co. in s.e. Kansas; intersected by the Lawrence and Southwestern railroad, and by two branches of the Missouri, Kansas, and Texas; drained by the Neosho river, flowing from n.e. to s.w., dividing it into two equal parts; 576 sq.m.; pop. '80, 15,124—14,156 of American birth. By far the greater part of the surface is an undulating prairie; wheat is raised in large quantities; Indian corn, oats, and grass are also staples. Limestone and coal are found. Co. seat, Erie.

NEOSHO RIVER, rises in e. central Kansas, in Morris co., and after flowing about 450 m. in a generally s.e. direction, empties into the Arkansas near fort Gibson. It passes through Morris, Lyon, Coffey, Allen, Neosho, and Labette counties., in Kansas, and then enters the Cherokee reservation in Indian territory, changing its direction to s.w. The country through which it passes is mostly prairie and good wheat land. Coal is found near its banks.

NEOZO'IC (Gr. new life), a term introduced by Edward Forbes to include all the strata from the trias to the most recent deposits. They are generally divided into the two great groups of secondary and tertiary rocks. This division is, however, quite arbitrary—the chief point of difference depending on the occurrence in the tertiary deposits of species supposed to be the same as some still living. There is no paleontological nor petralogical break similar to that which exists between the permian and trias. Forbes accordingly suggested the obliteration of the division between the secondary and tertiary series, and the division of all geological time into epochs—the paleozoic and the neozoic.

NE'PA AND **NEPIDÆ**. See Water-Scorpion.

NEPAUL', or Nipal, an independent kingdom of Hindustan, lying on the southern slope of the Himalayas, is bounded on the n. by Thibet, on the s. and w. by British India, and on the e. by Sikim, a protected state. Long. 80° 15′ to 88° 15′ east. It is 500 m. in length by about 100 m. in average breadth. Area, 56,745 sq.m.; pop. estimated (1873) at 3,000,000. The kingdom is separated from the plains of India by the long narrow strip of land, resembling an English down, but unhealthy, called the Terai, which extends along the whole southern border. North of this, and running parallel with it, is the great forest of Nepaul, from 8 to 10 m. broad. North of this strip is a tract of hilly country, and above that are two tracts of greater elevation, the first of which may be called mountainous, while the second might appropriately be called alpine, if it did not comprise among its mountains peaks, which, like mount Everest and Dhawalagiri, attain almost twice the elevation of mont Blanc. The principal rivers are the Kurnalli, the Gogra, the Rapti, the Gunduk with its tributaries, and the Kosi. The climate, most unhealthy in the Terai, is healthy and pleasant in the hilly and mountainous districts, suggesting that of southern Europe. In the *Valley of Nepaul*—the district surrounding the capital—the heat of Bengal, which is felt in the hollows, may be exchanged for the cold of Russia by ascending the slopes of the hills which inclose it. The soil is extremely rich and fruitful. Barley, millet, rice, maize, wheat, cotton, tobacco, sugar-cane, pine-apple, and various tropical fruits are cultivated. Gold has not been found, but iron and copper mines are worked. The inhabitants consist mainly of two tribes—the Ghurkas, whose chief occupation is war, and the Newars, who are principally artisans. The capital of the country is Khatmandu (q.v.).

NEPENTHE, a name derived from two Greek words meaning absence of grief, and applied to a narcotic drug employed by the Egyptians. Homer relates that Helen of Troy acquired from them the art of compounding the potion. Diodorus Siculus states that the women of Thebes were acquainted with the secret method of preparing it. Poe refers to it as producing forgetfulness:

> "Wretch!" I cried, "thy God hath lent thee—by these angels he hath sent thee
> Respite—respite and nepenthe, from thy memories of Lenore!
> Quaff, O quaff this kind nepenthe, and forget this lost Lenore!"
>
> —The Raven.

William Smith, author of *Greek and Roman Antiquities*, says of nepenthe, "Among the ancients, an Egyptian drug, which had an exhilarating effect, and which was supposed to obliterate all sorrow from the memory of those who partook of it—thought by many to have been opium."

NEPENTHÉS, the only known genus of a natural order of exogenous plants called *Nepenthaceæ*, consisting of herbaceous or half-shrubby plants with diœcious flowers, natives of swampy ground in India and China, chiefly remarkable for their leaves. Each leaf consists of a dilated foliaceous petiole, prolonged beyond its foliaceous part, as if it were the prolongation of the midrib of a leaf, and terminating in a pitcher (*ascidium*), from which the name Pitcher Plant has been very generally given to the species of this order. The pitcher is terminated by a lid, which is regarded as the true blade of the leaf. The fluid found in these pitchers is a secretion of the plant itself. Insects often enter the pitcher, and are apparently there dissolved and absorbed; so that the nepenthes would rank amongst the plants called "insectivorous" by Mr. Darwin. Pitcher plants (*N. distillatoria*) are not uncommon in our hot-houses.

NEPHELITE, (Gr. *nephelê*), a cloud, from its appearance. A unisilicate mineral. scapolite group, occurring in six or twelve-sided columnar, schorly crystals, with or without pyramidal point; white, transparent, luster glassy and greasy; when in masses, greenish, bluish-gray, brownish, or brick red. Angles: $O \wedge 1 = 135° 55'$; $a = 0.839$. Analysis (about), aluminum one-third, rather more silicon, rather less sodium, traces of carbon and potassium, with more hydrogen; atomic combination. Nephelite occurs both in ancient and modern volcanic rocks, mostly in grains or glassy crystals, and in metamorphic rocks allied to granite and gneiss, mostly in stout crystals. The former is sommite, the latter, eleolite. Eleolite occurs at Litchfield, Me., with cancrinite; in the Ozark mountains, Ark., with brookite and schorlomite; in a boulder, with sodalite, at Salem, Mass. The earliest name for nephelite is sommite, Delametherie, 1797, from the place where found on Vesuvius, then called fettstein by Werner, 1808, and eleolite (Gr. *elaion*, oil), from its greasy look, by Klaproth. The name of Haüy, 1801, has survived, and is owing to its becoming cloudy when immersed in strong acid. It is also called nepheline, and nefelina. (Dana, sys. of mineralogy, 1880.)

NEPHE'LIUM. See Litchi.

NE'PHRITE, a mineral which is not unfrequently called jade (q.v.), and of which axe-stone (q.v.) is very generally considered a variety. It is composed of silica, magnesia, and lime; is compact, with a coarse splintery fracture, very tenacious, sometimes translucent, greasy to the touch, and of a green or greenish color. It is found in granite, gneiss, greenstone, etc., in many parts of the world. Very fine specimens are brought from Persia, Siberia, and China, and are known as *oriental jade*. The kind called *Indian jade* is olive green, and strikes fire with steel; that from China is whitish, and does not strike fire. Nephrite is used for ornaments. The Turks make it into handles for sabers and daggers. Many imaginary virtues were once ascribed to it, such as the cure of epileptic fits and of nephritic (Gr. *nephros*, kidney) complaints; hence its name.

NEPHRI'TIS, (Gr. *nephros*, kidney), inflammation of the kidneys (q.v.).

NEPI, a t. in Italy. 40 m. from Rome; pop. 2,382. It was of Etruscan origin, but came under Roman control in 400 B.C. Many interesting archæological remains are found in the vicinity.

NEPOMUC. See JOHN OF NEPOMUK.

NE'POS, CORNELIUS, a Roman historian, born in the 1st c. B.C., but the place and precise time of his birth are unknown. He was the friend of Cicero and Catullus. The only work of Nepos's which has survived (if indeed it be his), is a series of twenty-five generally brief biographies of warriors and statesmen, mostly Greeks. These biographies are distinguished by the purity of their Latinity, the conciseness of their style, and their admirable exhibition of character, but sufficient care has not been exercised in the examination of authorities, nor is the relative importance of things duly regarded. Until the middle of the 16th c., these biographies, on the strength of the titles given in the various MSS., were generally ascribed to Æmilius Probus, a writer who lived in the latter part of the 4th c.; but in 1569, an edition was put out by the famous Dionysius Lambinus, who pronounced the so-called *Lives* of Æmilius Probus to be in reality the lost work of Cornelius Nepos, *De Viris Illustribus*. His weightiest argument is drawn from the excellence of the Latin, and the chastity of the style, so unlike the corrupt and florid language of the decline. Many critics hold that these lives ought to be regarded as an abbreviation of the work of Nepos by Probus. This hypothesis is not without its difficulties, but it is perhaps the least objectionable of any. There are many editions, among which may be mentioned those of Van Staveren (Leyd. 1773), of Tzschucke (Gott. 1804). and of Bremi (Zur. 1820); and the book is in general use as a school-book. It has been very frequently translated into English and other languages.

NEPTUNE, an ancient Italian god. It is doubtful whether he was originally a marine deity at all, for the old Italians were the very opposite of a maritime people, yet his name is commonly connected with *nato*, to swim; hence, at an earlier period he may have borne another designation, afterwards forgotten. When the Romans became a maritime power, and had grown acquainted with Grecian mythology, they, in accordance with their usual practice, identified him with the Greek god whom he most resembled. This was *Poseidōn*, also *Poteidan* (connected with *potos*, a drink, *pontos*, the sea, and *potamos*, a river). Poseidon appears in his most primitive mythological form as the god of water in general, or the fluid element. He was the son of Cronos (Saturn) and Rhea, and a brother of Jupiter. On the partition of the universe amongst the sons of Cronos, he obtained the sea as his portion, in the depths of which he had his palace near Ægæ, in Eubœa. Here also he kept his brazen-hoofed and golden-maned steeds, in a chariot drawn by which he rode over the waves, which grew calm at his approach, while the monsters of the deep, recognizing their lord, made sportive homage round his watery path. But he sometimes presented himself at the assembly of the gods on Olympus, and in conjunction with Apollo, built the walls of Troy. In the Trojan war he sided with the Greeks; nevertheless he subsequently showed himself inimical to the great sea-wanderer Ulysses, who had blinded his son Polyphemus. He was also believed to have created the horse, and taught men its use. The symbol of his power was a trident, with which he raised and stilled storms, broke rocks, etc. According to Herodotus, the name and worship of Poseidon came to the Greeks from Libya. He was worshiped in all parts of Greece and southern Italy, especially in the seaport towns. The Isthmian games were held in his honor. Black and white bulls, boars, and rams were offered in sacrifice to him. Neptune was commonly represented with a trident, and with horses or dolphins, often along with Amphitrite, in a chariot drawn by dolphins, and surrounded by tritons and other sea-monsters. As befitted the fluctuating element over which he ruled, he is sometimes figured asleep or reposing, and sometimes in a state of violent agitation.

NEPTUNE. See PLANETS, *ante*.

NEPTUNI'AN, a term formerly applied to the geologists who maintained the aqueous as against the igneous theory of the origin of rocks.

NÉRAC, a t. in the s.w. part of Lot-et-Garonne, a French department; situated on the river Boise, 15 m. s.w. of Agen; pop. about 7,500. It is divided into two parts; the old town on the right bank, picturesque but in decay; joined by bridges to the new town on the left bank. Ruins of a temple, aqueduct, and baths, indicate that a Roman city once occupied the site, but no information in regard to it is extant. There are also remains of a monastery of about 1250 A.D.; in later times changed into a castle. Nérac took the Calvinist side in the first part of the 17th c., but was overcome by the duke of

Mayenne in 1621. It has a large corn-market, and a good trade in flax, hemp, linen, wine and brandy.

NERBUD'DAH, a river of Hindustan, rises in the Vindhya mountains, at a height of from 3,000 to 4,000 ft. above sea-level, in lat. 22° 40′ n., long. 81° 52′ east. It flows w., past Jabalpur (190 m. from its source), where the great depression of the Vindhya mountains on the n. and the Satpura mountains on the s., known as the valley of the Nerbuddah begins. The other principal towns on its banks are Hoshangabad, Burwani, and Barneh. At Hoshangabad it is 900 yards wide, and from five to six feet in depth. At Barneh it begins to expand into a wide estuary, and after flowing 30 m. further, it falls into the gulf of Cambay. Entire length about 800 m., of which 55 are navigable for ships of considerable size.

NERCHINSK', an important mining t. of Russia, eastern Siberia, in the trans-Baikal territory, on the Nercha, a tributary of the Shilka, in lat. 51° 58′ n., long. 116° 35′ e., 4,707 m. from St. Petersburg. It was founded in 1658, and had, in 1867, 3,988 inhabitants. The district of which Nerchinsk is the center yields a good deal of gold yearly, together with large quantities of silver, lead, and iron, and precious stones. The only tin-mines in the empire are worked here. The soil in the vicinity is fertile, and the climate mild and agreeable.

NE'REIDS, in mythology. See NEREUS; NYMPHS; *ante*.

NERIAD', a t. of British India, in the presidency of Bombay and district of Kaira, on the route from Baroda to Ahmedabad, 38 m. n.w. from Baroda, on a feeder of the Sabarmati. It is the chief town of an extensive and well-cultivated tract, which produces much tobacco, and contains many prosperous towns and villages. Pop. '71, 25,520.

NE'REIS, a genus, and NEREI'DÆ, a family of *annelida*, having a long, slender body, a distinct head, with tentacles and eyes; the whole body covered with tubercles, and the gills lobed and tufted. They are all marine, and generally hide under rocks or in the sand. They swim actively, by rapid and undulating inflections of the body, and by the aid of numerous oars arranged along the sides; each formed of a stout footstalk, numerous bristles, and a flap. The proboscis is thick, strong, and armed with two jaws.

NE'REITES, the name given to animals which have left their impress on the Silurian rocks, and which exhibit a form similar to the modern Nereis. They occur on the surface of the laminæ of fine shales, over which, when it was soft, the creature moved, leaving a long and tortuous trail, which is generally found to terminate in a more defined representation produced apparently by the body itself, although every trace of it has disappeared. See ICHNOLOGY.

NEREUS, in mythology, a sea-god, son of Pontos and Gê, and father, by Doris, of the Nereïds. He had the gift of prophecy, and forewarned Paris of the destruction which the elopement of Helen would bring to Troy. Hercules, when seeking the golden apples of the Hesperides, was directed by the nymphs to the cave of Nereus, whom he found asleep. Nereus, on waking, transformed himself into a multitude of shapes, but was held fast by Hercules, whom he was obliged to instruct as to his quest.

NE'RI, PHILIP DE, a saint of the Roman Catholic church, and founder of the congregation of the oratory (q.v.), was b. of a distinguished family of Florence, July 21, 1515. His character, even in boyhood, foreshadowed the career of piety and benevolence to which he was destined, and he was commonly known among his youthful companions by the name of "good Philip." On the death of his parents, he was adopted by a very wealthy uncle, with whom he lived for some time at San Germano, near Monte Cassino, and by whom he was recognized as his destined heir. But he relinquished all these prospects for a life of piety and charity, and having come to Rome in 1534, he there completed his philosophical and theological studies, and won the esteem and reverence of all by his extraordinary piety, and his benevolence and activity in every good work, whether of charity or of religion. Although he did not receive priest's orders till 1551, he had already been for years one of the most earnest and devoted in all the pious works of Rome for the instruction of the poor, the care of the sick, and the reclamation of the vicious; and in 1550, in unison with several of his friends, he established a confraternity for the care of poor pilgrims visiting Rome, and other houseless persons, as well as of the sick generally, which still subsists, and which has numbered among its associates many of the most distinguished members of the Roman Catholic church. This confraternity, however, is chiefly noteworthy as having been the germ of the far more celebrated congregation of the oratory (q.v.), which was founded by St. Philip in concert with his friends Baronius and Tarugio, both afterwards cardinals, Sabriati, and some others. Besides the general objects above indicated, and the spiritual duties designed for the personal sanctification of the members, the main object of this association was the moral instruction and religious training of the young and uneducated, who were assembled in chapels or oratorios, for prayer and for religious and moral instruction. As a further means of withdrawing youth from dangerous amusements, sacred musical entertainments (thence called by the name of *oratorio*) were held in the oratory, at first consisting solely of hymns, but afterwards partaking of the nature of sacred operas or dramas, except that they did not admit the scenic or dramatic accompaniments of these more secular compositions. Religious and literary lectures also formed part of his plan.

and it was in the lectures originally prepared for the oratory that, at the instance of Neri, the gigantic *Church History* of Baronius had its origin. The personal character of Neri, the unselfish devotedness of his life, his unaffected piety, his genuine love of the poor, his kindly and cheerful disposition, and, perhaps, as much as any of the rest, a certain quaint humor, and a tinge of what may almost be called drollery which pervaded many of his sayings and doings, contributed to popularize his institute, and to engage the public favor for himself and his fellow-laborers. He himself enjoyed the reputation of sanctity and of miracles among his fellow-religionists almost beyond any of the modern saints; and he may still be described as emphatically the popular saint of the Roman people. He lived to an extreme age in the full enjoyment of all his faculties, and in the active discharge to the last of all the charitable duties to which his life had been devoted. He died at the age of 80, May 26, 1595. He was canonized by Gregory XV. in 1622. His only literary remains are his *Letters* (8vo, Padua, 1751); the *Constitutions* of his congregation, printed in 1612; some short spiritual treatises, and a few sonnets, which are printed in the collection of *Rime Oneste.*

NE'RIUM. See OLEANDER.

NE'RO, Roman emperor from 54 A.D. to 68 A.D., was b. at Antium, on the coast of Latium, Dec. 15, 37 A.D., and was the son of Cn. Domitius Ahenobarbus and of Agrippina, the daughter of Germanicus Cæsar, and sister of Caligula. His mother, becoming the wife of the emperor Claudius, Claudius adopted him (50 A.D.), and his name, originally L. Domitius Ahenobarbus, was changed to Nero Claudius Cæsar Drusus Germanicus. After the death of Claudius (54 A.D.), the Pretorian guards, at the instigation of Afranius Burrhus, their prefect, declared him emperor, instead of Claudius's son Britannicus, and their choice was acknowledged both by the senate and the provinces. His reign began with the semblance of moderation and good promise, under the guidance of Burrhus and his tutor Seneca the philosopher; but the baleful influence of his mother, together with his own moral weakness and sensuality, frustrated their efforts, and he soon plunged headlong into debauchery, extravagance, and tyranny. He caused Britannicus, the son of Claudius, to be treacherously poisoned at the age of 14, because he dreaded him as a rival, and afterwards (59 A.D.) caused his own mother Agrippina (with whom he was latterly on bad terms) to be assassinated, to please his mistress Poppæa Sabina (the wife of his principal boon-companion Otho, afterwards emperor), in order to marry whom he also divorced and afterwards put to death his wife Octavia (aged 20), the sister of Britannicus. The low servility into which the Roman senate had sunk at this time, may be estimated from the fact that it actually issued an address congratulating the hateful matricide on the death of Agrippina. Nero himself, on the other hand, confessed that he was ever haunted by the ghost of his murdered mother. The affairs of the empire were at this time far from tranquil. In 61 A.D. an insurrection broke out in Britain under queen Boadicea, which was, however, suppressed by Suetonius Paulinus. The following year saw an unsuccessful war against the Parthians in Armenia. At home, matters were not much better. The emperor was lampooned in verse; the senate and priesthood, alike venal, were also satirized by audacious malcontents; Burrhus, a valuable friend, died; and even Seneca, though not a great moralist, out of his books, thought it only decent to remove from court. In July, 64, occurred a great conflagration in Rome, by which two-thirds of the city were reduced to ashes. Nero himself is usually believed to have been the incendiary. It is said that he admired the spectacle from a distance, reciting verses about the burning of Troy, but many scholars are doubtful whether he really had any hand in it. At all events he laid the blame on the Christians—that mysterious sect, who, like the Jews in the middle ages, were the cause of all otherwise inexplicable calamities, and persecuted them with great fury. Moreover, he rebuilt the city with great magnificence, and reared for himself on the Palatine hill a splendid palace, called, from the immense profusion of its golden ornaments, the *Aurea Domus*, or Golden House; and in order to provide for this expenditure, and for the gratification of the Roman populace by spectacles and distributions of corn, Italy and the provinces were unsparingly plundered. A conspiracy against him failed in the year 65, and Seneca and the poet Lucan fell victims to his vengeance. In a fit of passion he murdered his wife Poppæa, by kicking her when she was pregnant. He then proposed to Antonia, the daughter of Claudius, but was refused, whereupon he caused the too fastidious lady to be put to death, and married Statilia Messallina, after killing her husband. He also executed or banished many persons highly distinguished for integrity and virtue. His vanity led him to seek distinction as a poet, a philosopher, an actor, a musician, and a charioteer, and he received sycophantic applauses, not only in Italy, but in Greece, to which, upon invitation of the Greek cities, he made a visit in 67. But in 68, the Gallic and Spanish legions, and after them the Pretorian guards, rose against him to make Galba emperor, and Nero fled from Rome to the house of a freedman, Phaon, about four miles distant. The senate, which had hitherto been most subservient, declared him an enemy of his country, and the tyrant ended his life by suicide, June 11, 68. One is sorry to learn that such a wretch had a taste for poetry, and was skilled in painting and modeling.

NER'VA, M. COCCEIUS, a Roman emperor, elected by the senate after the murder of Domitian, Sept. 18, 96. He was born 32 A.D., of a family belonging to Narnia, in

Umbria, and twice held the honor of consulship, before his election to the dignity of emperor. He displayed great wisdom and moderation, rectified the administration of justice, and diminished the taxes; but finding himself, upon account of his advanced age, not vigorous enough to repress the insolence of the Pretorian guards, he adopted M. Ulpius Trajanus, then at the head of the army of Germany, who succeeded him on his death, Jan. 27, 98. After his decease, he obtained an apotheosis.

NERVE. See NERVOUS SYSTEM, *ante.*

NERVE CELL. See HISTOLOGY.

NERVII, an ancient tribe in Belgica, n. of the Ambiani. In the time of Cæsar, who first mentions them, they were a warlike people, who prohibited trade with their neighbors, forbade the introduction of luxuries, and attempted to make an alliance of the surrounding tribes against the Romans. Upon Cæsar's advance into their territory they sent their children and old men and women to a place of safety in the marshy country near the sea, and stationed themselves in ambuscade along the banks of the river Sabis, now the Sambre. When the Romans came up, and began to prepare their camp, they were suddenly attacked by a force of 60,000 men, and only the military skill of Cæsar saved them from defeat. After a desperate contest the Nervii were put to flight. In 54 B.C., however, they joined the Eburones in an assault upon the camp of Quintus Cicero. They submitted to the Romans, 53 B.C. Their chief towns were Camaracum, now Cambrai, and Bagacum, now Bavai.

NERVOUS DISEASES OF AN OBSCURE NATURE AND **NERVOUSNESS.** Although the most important affections of the nervous system, as chorea, convulsions, epilepsy, hydrophobia, hypochondriasis, hysteria, neuralgia, paralysis, spasms, and tetanus, have been considered in special articles, there is an infinite variety of (often evanescent) forms which the diseases of the nervous system assume, some of which we propose now to consider.

These nervous affections are almost solely confined to women, and most of them may be regarded as modified forms of hysteria. *Simulated pregnancy*, or, as the French physicians term it, *nervous pregnancy*, is an affection of not very rare occurrence. The abdomen gradually enlarges, the catamenia are suppressed, and sickness, enlargement of the breasts, with the other symtoms of pregnancy, supervene (as far as they can be recognized by the non-professional observer), and it is only the non-appearance of the infant at the expected period that leads to a suspicion of the true nature of the case. The diagnosis of such a case is extremely difficult, and the most celebrated accoucheurs have been deceived. We commence with this extreme instance, as being singularly illustrative of the power which a perverted action of the nervous system may impress upon certain persons. The somewhat allied cases in which patients persist in fancying themselves pregnant in opposition to the opinion of their medical adviser (as the well-known case of queen Mary, so admirably drawn by Froude), are far more numerous. The intestines are often implicated in cases of a deranged condition of the nervous system. The excretion of gas from the intestinal mucous membrane is often much increased in the class of patients commonly called nervous. The rattling sounds produced by the movement of the gas—scientifically known as *bomborygmi*—are sometimes so loud as to prevent the patient from entering into society with comfort; and sometimes the mere fear of the occurrence of these sounds is sufficient to induce them. A depraved appetite, scientifically known as *pica*, is a common symptom of deranged nervous system both in chlorotic young women, in whom the catamenial discharge is not well established, and in pregnant women. See MORBID APPETITES. The not very rare cases of fasting women and girls belong to the same category. All these cases, however, ultimately undergo detection.

Dr. Parry and other physicians have described cases of morbid sensibility of the mucous membrane of the pharynx, in which the muscles of the larynx are called into violent action if the patient takes a sip of water or other fluid. Such cases so strongly simulate hydrophobia that they are described as hysteric hydrophobia.

Passing on to the special modifications which an abnormal state of the nervous system impresses on the organs of circulation, we have nervous palpitation of the heart, which may readily be distinguished from palpitation dependent on change of structure by due attention to symptoms. There is a peculiar form of abdominal pulsation, due solely to nervous influence, which may not very unfrequently be felt on pressing the hand on the patient's abdomen. It has in many cases been mistaken for aneurism.

The nervous symptoms implicating the respiratory organs are not only the most common of any, but are alarming and urgent, and may be readily mistaken for indications of serious inflammatory or organic disease. Nervous asthma, which is supposed to depend upon a spasmodic constriction of the bronchial tubes, is too well known to require comment. Women suffering from a deranged condition of the nervous system sometimes present symptoms of what may be termed nervous catarrh—such as a copious flow of tears, free discharge from the nostrils, and constant sneezing. Such cases are often periodic. They may be treated with preparations of iron, and are sometimes at once checked by a pinch of snuff. There are various forms of cough due mainly to nervous irritation, the difference in the character of the cough probably depending on the spot which is the seat of irritation. Thus, we hear of *spasmodic* cough, which is often accompanied by much straining and convulsive agitation, and somewhat resembles whooping-cough; *ringing* cough, accompanied by dyspnœa and hoarseness, or loss of voice; *barking* cough, often arising from irritation of the ovaries, etc. Such coughs as these are aggravated by depleting measures, ordinary cough medicines, etc., and usually disappear under the use of tonics.

The nervous affections of the motor system are conveniently grouped by Dr. Laycock under three heads—(1) the first including those cases in which there is paralysis or spasm without distortion; (2) those in which distortion follows cessation of muscular equilibrium, as in the various forms of club-foot; and (3) paroxysmal affections. The best example of the *first* class is hysterical paralysis of the lower extremities, of which sir Benjamin Brodie long ago wrote as follows: "I have known not a few, but very numerous, instances of young ladies being condemned to the horizontal posture, and even to the torture of caustic issues and setons, for several successive years, in whom air, and exercise, and cheerful occupations would probably have procured a cure in the course of a few months." A notice of such cases as these may be found in the article HYSTERIA. Paralysis of a lateral half of the body, or of one limb only, may also be merely a manifestation of hysteria. The *second* class is well illustrated by the following case, which is reported by Mr. Shaw. A young lady who had suffered from a train of symptoms indicative cf a disturbed nervous system, had the ankle so turned round that she walked on one side of the foot. The knee was also bent outward, and the spine was becoming distorted. Sir Charles Bell, who saw her in consultation, regarded the case as one of willful deception, and in a year's time his diagnosis was completely established, scarcely any trace of lameness being apparent. Many of the joints—as the knee, hip, etc.—may be the seats of purely neuralgic symptoms, which so closely simulate organic disease of the cartilages, as to lead to the removal of the limb. Carmichael, Brodie, and others have recorded cases in which this terrible mistake has been made by experienced surgeons. Spinal irritation, or spinal tenderness, is a mysterious affection, whose diagnostic value is not very definite, as it may arise from a large number of distinct conditions, as, for example, disease of some part of the spinal cord, uterine disease, chronic disease of the intestinal viscera, etc.

One of the most anomalous affections of the nervous system ever recorded is described by Mr. Holden in the *St. Bartholomew's Hospital Reports*, 1867, vol. iii., pp. 299–305. The patient was a bright-looking boy about 12½, who, as he lay reading in bed, presented every appearance of perfect health: all that he complained of was what he called his "bump," which was about the size of a hen's egg, and lay on the right side of the neck, just above the shoulder. If the "bump" were touched, even most gently, the boy instantly lost all consciousness, and became deaf, dumb, and blind, while his body became arched like a bow, and was supported only by the back of the head and the heels, while his arms were rigidly extended. He might be pinched or pricked, but showed no sign of sensation. After remaining in this state for somewhat less than a minute, he drew a deep long breath, which was followed by a deep sigh. Instantly the spasm ceased, and the body fell, seemingly lifeless, on the bed. After two other similar sighs, which occurred in a few seconds, the boy awoke as if from profound sleep, and in a few minutes was none the worse for what he had gone through. Whenever the bump was touched—even when the boy was fast asleep—the same phenomena occurred. (It was found that, on touching the backbone in the dorsal region, the same series of events happened.) By continuous gentle manipulation of the bump, the boy was kept unconscious for twenty minutes. Another and even more remarkable phase of the boy's affection was his crowing and barking fit, which took place every day at the same time, almost to a minute. See the reports above cited.

With this illustration, we close our remarks on what may be termed *anomalous nervous affections*. With regard to *nervousness*, which also stands at the head of this article, we may observe, that it is a word pertaining rather to the vocabulary of the patient (and pre-eminently of the female patient) than of the physician. It is usually understood to indicate a condition of which a restless mobility, with or without an undue excitability of the nerves of sensation, is the chief characteristic. For further information on this subject, the reader is referred to Dr. Laycock's various works, and to Romberg *On Diseases of the Nervous System*, 2 vols., translated by Dr. Sieveking.

NERVOUS SYSTEM, THE, is composed in all vertebrated animals of two distinct portions or systems—viz., the *cerebro-spinal* and *sympathetic* or *ganglionic*.

The *cerebro-spinal system* includes the brain and spinal cord (which form the *cerebro-spinal axis*), and the cranial and spinal nerves. It was termed by Bichat the nervous system of animal life, and comprises all the nervous organs concerned in sensation, volition, and mental action.

The *sympathetic system* consists essentially of a chain of ganglia connected by nervous cords, extending from the cranium to the pelvis, along each side of the vertebral column, and from which nerves with large ganglionic masses proceed to the viscera and blood-vessels in the cavities of the chest, abdomen, and pelvis. It was termed by Bichat the nervous system of organic life, since it seems to regulate—almost or quite independently of the will—the due performance of the functions of the organs of respiration, circulation, and digestion.

The essential parts of the *cerebro-spinal axis* are described in the articles BRAIN, CEREBRUM and CEREBELLUM, and SPINAL CORD. The brain and spinal cord are covered and protected by three membranes or *meninges*, as they are frequently termed—viz., the *dura mater*, the *arachnoid*, and the *pia mater*. The *dura mater* is a strong fibrous membrane, which supplies the cranial bones with blood in early life, and adheres firmly to their inner surface. It is less closely attached to the bony walls of the spinal canal. Inside the cranium it gives off processes (such as the *falx cerebri*, *tentorium cerebelli*, and *falx cerebelli*) which divide and support different parts of the brain; it gives a strong fibrous sheath to every nerve; and by splitting into two layers at certain points, it forms receptacles for venous blood, which are termed SINUSES (q v.). The *arachnoid* (so called from its being supposed to be as thin as a spider's web) is a serous membrane, and, like all serous membranes, is a closed sac, consisting of a parietal and visceral layer. The parietal layer adheres to the inner surface of the *dura mater*, to which it gives a smooth, polished appearance; while the visceral layer somewhat loosely invests the brain and spinal cord, from direct contact with which, however, it is separated by the intervention of the *pia mater* and some loose areolar tissue. In most regions there is an interval between the visceral layer of the *arachnoid* and the *pia mater*, which is called the *sub-arachnoid cavity*, and is filled during life by the *cerebro-spinal fluid*. This fluid, which varies in quantity from two to ten ounces, keeps the opposed surfaces of the arachnoid in close contact, and affords mechanical protection to the nervous centers which it surrounds, and guards them against external shocks. It is accumulated in considerable quantity at the base of the brain, where it serves for the protection of the large vessels and nerves situated there. In fracture of the base of the skull, the draining away of this fluid, often in very large quantity, through the external auditory meatus, is often one of the most significant symptoms. It is doubtless secreted by the *pia mater*, which is the immediate investing membrane of the brain and spinal cord. This membrane consists of minute blood-vessels, held together by an extremely fine areolar tissue. It dips down between the convolutions and fissures of the brain, and is prolonged into the interior, forming the *velum interpositum* and the choroid plexuses of the fourth ventricle. It is by means of this membrane that the blood-vessels are conveyed into the the nervous substance.

We now proceed to notice the nerves connected with the cerebro-spinal center or axis. These are usually described in two classes—the *spinal* and the *cranial* or *encephalic*. The former class consists of all those which arise from the spinal cord, and emerge from the spinal canal through the inter-vertebral foramina; while the latter includes those which arise from some part of the cerebro-spinal center, and emerge through foramina in the cranium or skull.

The *spinal nerves* (exclusive of the spinal accessory nerve, which, from the fact that it emerges from the skull, is usually ranked among the cranial nerves) are thirty-one on either side, there being a pair for each pair of intervertebral foramina (whose formation is described in the article VERTEBRA AND VERTEBRAL COLUMN)., and for the foramina between the atlas (the first or highest vertebra) and the occipital bone at the base of the skull. Every spinal nerve arises from the cord by two roots, an anterior and a posterior, of which the latter is distinctly the larger. Each root passes out of the spinal canal by a distinct opening in the *dura mater*. Immediately after its emergence, a ganglion is seen on the posterior root, and in the anterior surface of this ganglion the anterior root lies imbedded. Just beyond the ganglion, but not at all previously, the nervous fibers of both roots intermingle, and a compound nerve results. The trunk thus formed separates immediately after it has passed through the intervertebral canal into two divisions—the anterior and posterior—each of which contains filaments from both roots, and possessing, as will be immediately shown, perfectly different functions. These divisions, of which the anterior is considerably the larger, proceed to the anterior and posterior parts of the body respectively, and are distributed to the skin and the muscles. The anterior branch communicates with the sympathetic nerve, as is shown in the figure. The mode of connection of the roots of the nerves with the cord is noticed in the article SPINAL CORD. These nerves are arranged in classes, according to the regions of the spine in which they originate, and we thus speak of eight cervical, twelve dorsal, five lumbar, and six sacral nerves on either side.

The discovery of the separate functions of the anterior and posterior roots of the spinal nerves, which has been characterized as the first important step towards a right understanding of the physiology of the nervous system, was made by our distinguished countryman sir Charles Bell, although there is reason to believe that Magendie, without any knowledge of Bell's experiments, arrived at similar conclusions at nearly the same time. The original experiments consisted in laying open the spinal canal in rabbits, and irritating or dividing the roots of the spinal nerves. It was observed that irritation of the anterior roots caused muscular movement, and that the posterior roots might be irritated without giving rise to any muscular action; while division of the posterior roots did not impair the voluntary power over the muscles. Hence it was inferred that the anterior roots were motor (or conveyed motive power to muscles), and the posterior roots not motor; but it was not fully determined what degree of sensibility remained in parts supplied from the divided roots. Numerous physiologists arrived at similar results to those of Bell; but the most conclusive experiments are those of Müller, who operated on frogs, in which, from the great width of the lower part of the spinal canal, the roots of the nerves can be exposed with great facility. In these experiments, it was found that irritation of the anterior root always excited muscular contraction, while no such effect followed irritation of the posterior root; that section of the anterior root caused paralysis (or loss of power) of motion, while section of the posterior root caused paralysis of sensation; and that when the anterior roots of the nerves going to the lower extremity were cut on one side, and the posterior roots on the other, voluntary power without sensation remained in the latter, and sensation without voluntary motion in the former. The obvious conclusion to be derived from these experiments is, that the anterior root of each spinal nerve is *motor*, and the posterior *sensitive*. (In place of the terms *sensitive* and *motor*, the terms *afferent* and *efferent* are now frequently used. The functions of the nerves being to establish a communication between the nervous centers and the various parts of the body, and *vice versâ;* an *afferent* nerve communicates the impressions made upon the peripheral nervous ramifications to the centers, while an *efferent* nerve conducts the impulses of the nervous centers to the periphery.)

The *cranial nerves*, although twelve in number on either side, were arranged by Willis (*Cerebri Anatome; cui accessit Nervorum Descriptio et Usus*, 1664), whose system is still generally adopted, in nine pairs, which, taken from before backwards in the order in which they are transmitted through the foramina at the base of the skull, stand as follows: 1st, olfactory; 2d, optic; 3d, motores oculorum; 4th, pathetic; 5th, trifacial; 6th, abducentes; 7th, portio dura or facial, portio mollis or auditory; 8th, glossopharyngeal, par vagum or pneumogastric, spinal accessory; 9th, hypoglossal.

They may be subdivided into three groups, according to their functions—viz. *nerves of special sense*—the olfactory (see NOSE), optic (see EYE), and auditory (q.v.); *nerves of motion, or efferent nerves*—the motores oculorum, pathetic, abducentes, facial, and hypoglossal; and *compound nerves*—the trifacial, glossopharyngeal, pneumogastric, and spinal accessory.

The reason why no nerve of taste is included in the above arrangement amongst the nerves of special sense will be subsequently seen; and we proceed briefly to notice the functions of the motor cranial nerves.

The 3d, 4th, and 6th pairs—the *motores oculorum, pathetic*, and *abducentes*—together make up the apparatus by which the muscles of the orbit (the four recti, the superior and inferior oblique, and the levator palpebræ) are called into motion, and are sufficiently noticed in the article EYE.

The *facial nerve*, or the *portio dura* of the 7th pair, is divisible into three stages. The first stage is the intercranial, from its origin to its exit from the cranial cavity, in association with the *portio mollis* or *auditory nerve* (q.v.), at the internal auditory meatus. The second stage is contained in the *aqueduct of Fallopius*, a bony canal lying in the petrous portion of the temporal bone. In this stage it anastomizes with other nerves, and thus *sensory* fibers are introduced into it from the 5th pair and other sources, which make irritation of some of its branches to cause pain. The third stage commences with the emergence of the nerve through the stylo-mastoid foramen. The nerve now lies in the parotid gland, and after giving off the *posterior auricular*, and a few smaller branches, finally divides into the *temporal, facial*, and *cervical* branches. This diverging distribution of the nervous branches over the face forms the *pes anserinus* of the older anatomists, from the supposed resemblance to the expanded foot of a goose. Careful dissection of this nerve shows that the great majority of its fibers are distributed to muscles; and indeed, if we except the muscles of mastication, which receive their motor power from the 3d division of the 5th pair, this may be regarded as the general motor nerve of the face. "The muscles which are supplied by the facial nerve are chiefly those upon which the aspect of the countenance and the balance of the features depend. The power of closing the eyelids depends upon this nerve, as it alone supplies the orbicularis palpebrarum; and likewise that of frowning, from its influence upon the corrugator supercilii. Anatomy indicates that this nerve is the motor nerve of the superficial muscles of the face and ear, and of the deep-seated muscles within the ear. This conclusion is abundantly confirmed by comparative anatomy. For wherever the superficial muscles of the face are well developed, and the play of the features is active, this nerve is large. In monkeys it is especially so. That extremely mobile instrument, the elephant's trunk, is provided with a large branch of the facial as its motor nerve. In birds, on the other hand, it is very small."—Todd and Bowman, *Physiological Anatomy and Physiology of Man*, vol. ii. p. 107.

Before sir Charles Bell commenced his experiments on the functions of the nerves, it was believed that the facial was the nerve of sensibility of the face, and it was on several occasions divided with the view of relieving tic douloureux, of which it was supposed to be the seat. But the operation, of course, yielded no relief, and always inflicted a permanent injury, since it was succeeded by paralysis of the facial muscles, with total loss of control over the features and over the closing of the eye, on the side on which the operation was performed.

The treatment of facial palsy, which is often, especially if it arises from cold, a very temporary affection, although usually a very alarming one to the patient and his friends, is described in the article PARALYSIS.

The *hypoglossal nerve* (derived from the Greek words *hypo*, under, and *glotta*, the tongue) escapes from the cavity of the skull by the anterior condyloid foramen, and passes outward and forward around the pharynx to the interior surface of the tongue, where it breaks up into its terminal branches, which supply the muscular structure of that organ with motor power. This nerve communicates with the pneumogastric nerve, with the sympathetic (by branches derived from the superior cervical ganglion), and with the cervical plexus, soon after its emergence from the cranium; and subsequently, as it curves round the occipital artery, it gives off the long anastomosing branch known as the *descendens noni*.

Experiments on living animals, comparative anatomy, and pathological investigations alike indicate that this is the motor nerve of the tongue. In cases of paralysis of this nerve the power of articulation is much injured or totally destroyed; and this is often one of the first symptoms which lead the physician to apprehend serious cerebral lesion.

We now proceed to the consideration of the *compound nerves*, beginning with the *trifacial* or *fifth nerve*. This nerve, as was first pointed out by sir Charles Bell, presents a remarkable resemblance to the spinal nerves in its mode of origin; for it arises by two roots, one large and the other small, and on its larger root, as on the posterior and larger root of the spinal nerves, is a distinct ganglion; the two roots being quite distinct until after the formation of the ganglion, when the lesser one coalesces with the lowest branch, which emerges from the ganglion to form the inferior maxillary nerve. This ganglion, which is known as the gasserian ganglion, and which is formed upon the larger root of the nerve, lies upon the upper surface of the petrous portion of the temporal bone, and is of a somewhat triangular form, with its base directed forward and outward. From this base there proceed three nerves—viz., the ophthalmic, on the inside; the superior maxillary, in the middle; and the inferior maxillary, externally. The first two of these nerves consist exclusively of fibers from the ganglionic root, while the third—the inferior maxillary—is composed of fibers from both roots, and is, therefore, a compound nerve. From the mode of distribution, as well as from that of origin, it is inferred that the ophthalmic and superior maxillary are purely sensory, while the inferior maxillary is a motor and sensory nerve. Experiments on living animals confirm the inference, that have been drawn on anatomical grounds. Division of the ophthalmic or of the superior maxillary nerve induces loss of sensibility, without any serious impairment of muscular power; but when the inferior maxillary nerve, on either side, is divided, the power of mastication is destroyed on that side, and the sensibility of the tongue and of the lower part of the face on that side is lost.

The lingual or gustatory branch of the inferior maxillary is distributed to the mucous membrane and papillæ at the fore part and sides of the tongue, where it acts both as a nerve of common sensibility and of taste. (The consideration of the respective parts which this nerve and the glossopharyngeal play in the sense of taste, is considered in the articles TONGUE and SENSE OF TASTE.)

The trifacial nerve is the seat of the affection known as tic-douloureux, and described in the article NEURALGIA. It is in the dental branches of this nerve that toothache is situated; and in the process of teething in young children, the irritation of these branches, consequent upon the pressure of the teeth, often gives rise to convulsions, by being conveyed to the medulla oblongata, and exciting motor nerves by reflex action.

The *glossopharyngeal nerve* is principally an afferent or sensory nerve, but has a small motor root. It escapes from the cranium in association with the pneumogastric and spinal accessory nerves, through the same foramen as that through which the jugular vein emerges. It then descends by the side of the pharynx, and after anastomising with the facial and pneumogastric nerves, and giving off a branch to the tympanum of the ear, terminates in branches to the mucous membrane of the base of the tongue, of the palate, tonsils, and pharynx, and in twigs to the digastric and stylopharyngeal muscles; so that its distribution is almost entirely to sentient surfaces. From a careful examination of the investigations of Dr. John Reid and others regarding the functions of this nerve, Todd and Bowman arrive at the following conclusions: 1. "It is the sensitive nerve of the mucous membrane of the fauces and of the root of the tongue, and in the latter situation it ministers to taste and touch, as well to common sensibility; and being the sensitive nerve of the fauces, it is probably concerned in the feeling of nausea, which may be so readily excited by stimulating the mucous membrane of this region." 2. "Such are its peripheral organization and central connections, that stimulation of any part of the mucous membrane in which it ramifies, excites instantly to contraction all the facial muscles supplied by the pneumogastric and the facial nerves; and the permanent irritation of its peripheral ramifications, as in the case of sore throat, will affect other muscles supplied by the facial nerve likewise. It is, therefore, an excitor of the movements necessary to pharyngeal deglutition."—*Op. cit.* vol. ii., p. 119.

The *pneumogastric nerve*, or *par vagum*, is distributed to so many important organs (the larynx, heart, lungs, stomach, etc.), and is of such great physiological importance, that a special article is devoted to its consideration.

The *spinal accessory nerve* is more remarkable for its peculiar course than in any other respect. It rises from the spinal cord at the level of the fifth or sixth cervical nerve, passes upwards between the anterior and posterior roots of the cervical nerves into the skull, and emerges from the cranial cavity with the two preceding nerves. It is chiefly distributed to the trapezius muscle.

In the above remarks on the cranial nerves, we have omitted all notice of their points of origin, as that subject is sufficiently noticed in the article BRAIN.

We shall now briefly notice the mode in which the extremities receive their nerves. These nerves are derived from the spinal nerves, through the intervention of what is termed in anatomy a *plexus*. Four or five nerves proceed from the spinal cord for a certain distance, without any communication with each other. They then divide, and from the conjunction of the adjacent branches new nerves result, which again subdivide and interchange fibers. From the net-work or plexus thus formed nerves emerge, each of which is composed of fibers derived from several of the original branches. The most important of these plexuses are found in the regions of the neck, the axilla, the loins, and the sacrum, and are known as the cervical, brachial, lumbar, and sacral plexuses.

The *brachial plexus* is formed by communication between the anterior roots of the last four cervical nerves and the first dorsal nerve. These nerves are nearly equal in size, and their mode of distribution is sufficiently explained by the diagram. The branches emerging from this plexus supply the shoulder and the arm; and the names of the most imporant of these branches are given in the description attached to the figure.

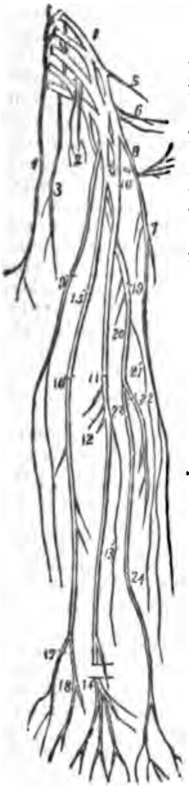

FIG. 1.—A diagram showing the brachial plexus of nerves of the left side, with its branches. Front view. 1, the brachial plexus; 2 and 3, the anterior and posterior thoracic nerves; 4, the phrenic nerves going to the diaphragm; 7 and 9, the external and internal cutaneous nerves; 10, the origin of the median nerve (which receives its name from taking a course along the middle of the forearm to the palm of the hand); 12 and 13, branches of this nerve; 14, the point at which it passes under the annular ligament, and divides into its terminal branches, which are distributed to the thumb and to all the fingers except the little finger and the outside of the ring finger, which are supplied by (15) the ulnar nerve, whose terminal branches are shown at 18; 19, the musculo-spiral nerve (the largest of the plexus); 23, 24, the radial nerve, one of the branches of the musculo-spiral.

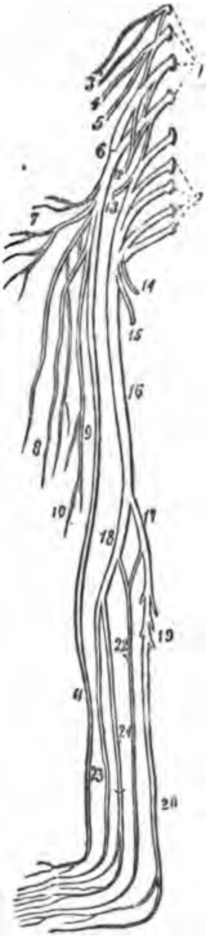

FIG. 2.—A diagram showing the lumbar and sacral plexuses, with the nerves of the lower extremity. 1, the first four lumbar nerves which, with the branch from the last dorsal, form the lumbar plexus; 2, the four upper sacral nerves, which, with the last lumbar, form the sacral plexus; 6, the anterior crural or femoral nerve; 7, 8, 9 10, its branches; 11, its terminal branch, the long or internal saphenous; 13, the gluteal nerve; 15, the lesser ischiatic nerve; 16, the greater ischiatic or sciatic nerve (the largest nerve in the body), dividing at about the lower third of the thigh, into 17, the popliteal nerve, and 18, the peroneal nerve; 19, muscular branches of the popliteal, given off in the posterior region of the knee; 20, the posterior tibial nerve, dividing, at 21, into the internal and external plantar nerves, which are distributed to the sides of the toes in precisely the same manner as the median and ulnar nerves are distributed to the fingers; 22, the external saphenous nerve; 23 and 24, the two terminal branches of the peroneal nerve—viz., the anterior tibial and the musculo-cutaneous nerves.

The *lumbar* and *sacral plexuses*, with the nerves of the lower extremity, are shown in Fig. 2. The description attached to the diagram sufficiently explains the mode of formation and the distribution of the branches of these plexuses.

The general arrangement of the *sympathetic system*, or, as it is sometimes termed, the *sympathetic nerve*, has been already noticed at the beginning of this article. Its cephalic portion consists of four ganglia on either side—viz., (1) the ophthalmic, or lenticular ganglion; (2) the spheno-palatine, or Meckel's ganglion; (3) the otic, or Arnold's ganglion; and (4) the submaxillary ganglion. They are all closely connected with the branches of the trifacial nerve. The cervical portion contains 3 ganglia, the dorsal 12, the lumbar 4, the sacral 5, and the cocygeal 1, which, instead of lying on the side of the vertebral column, is placed in front of the coccyx, and forms a point of convergence for the two ganglionated cords which run from the cervical to the sacral region parallel to one another. Each ganglion may be regarded as a distinct nervous center, from which branches pass off in various directions. In addition to the cords of communication between the ganglia, certain sets of nerves may be usually traced—viz., (1) *visceral* nerves, which generally accompany branches of arteries to the viscera (the lungs. heart, kidneys, liver, spleen, and intestines, etc.); (2) *arterial* branches, distributed to arteries in the vicinity of the ganglia; and (3) branches of *communication* with the cerebral and spinal nerves.

The only sympathetic nerve that our limited space will permit us to notice is the *great splanchnic.* This nerve arises by separate roots from the 5th, 6th, 7th, 8th, and 9th thoracic ganglia. These roots unite to form a large round cord, which passes obliquely downwards and forwards, and after entering the abdomen by piercing the diaphragm, ends in a large and complex ganglion, the *semilunar ganglion,* which lies upon the side and front of the aorta, at the origin of the cœliac axis. The semilunar ganglia, with the nerves entering and emerging from them, combine to form the *solar plexus,* which, from the mass of nervous matter which it contains, has been termed the *abdominal brain.* It is in consequence of the existence of this great nervous center, that a blow in the region in which it lies always inflicts a severe nervous shock, and not unfrequently causes death.

Experiments and clinical observations lead to the conclusion that the sympathetic system supplies motor power to many of the internal viscera, especially the heart and the intestinal canal; that it also contains sensitive fibers, as is shown by the sufferings of patients during the passage of a gall-stone or a renal calculus through a duct, whose sole nervous energy is derived from this system; that it presides over the process of secretion in the most important glands; and that it operates on the blood-vessels in causing them to contract, while the cerebro-spinal nerves produce the opposite effect.

On examining different parts of the nervous system under the microscope, we find that the nervous matter is distributed in two forms, the *vesicular* and the *fibrous.* The vesicular matter is gray in color, and granular in texture, contains nucleated nerve cells, and is largely supplied with blood; it is immediately associated with mental actions, and is the seat in which the force manifested in nervous action originates. The fibrous matter is, in most parts, white and composed of tubular fibers, though in some parts it is gray and consists of solid fibers; it is less vascular than the former, and is simply the conductor of impressions made upon it. When these two kinds of matter are united together into a mass they form a *nervous center,* such as the brain or spinal cord, while the *nerves* passing to and from them are composed of threads of fibrous matter. The nervous matter of both kinds is a soft, unctuous substance, with very slight tenacity; the softness being in a great measure due to the large quantity of water which it contains.

The *fibrous* form is the most extensively diffused throughout the body. It forms a large portion of the nervous centers, and is the main constituent of all the nerves. It occurs in two varieties, viz., as the *tubular fiber,* or the *nerve tube,* and the *gelatinous fiber,* the latter being of comparatively rare occurrence, and being found chiefly in the sympathetic system.

When a *tubular fiber* is viewed by reflected light, it presents a beautiful pearly luster, and appears to be homogeneous. But if viewed by transmitted light, with a sufficient magnifying power, indications of structure become visible. Externally, there is the *tubular membrane,* a homogeneous and probably very delicate elastic tissue, according to Todd. Within the edge of the tubular membrane, on either side are seen two thicker and darker lines, which appear to mark the outer and inner limits of the structure known as the *white substance of Schwann,* which forms a tube within the tubular membrane; and within the white substance of Schwann is a transparent material occupying the axis of the nerve tube, and commonly known as the *axis cylinder.* By the application of reagents, it is seen that the chemical composition of the white substance is different from that of the axis cylinder, and hence the functions of these two parts are doubtless different; the latter is in general soft and pulpy. The nerve-tubes are cylindrical in form, and lie parallel to one another, without any inosculation, if we except their frequent terminations in loops. Their average diameter is about $\frac{1}{5000}$th of an inch.

The *gelatinous fibers* are flattened, soft, and homogeneous in appearance, and contain numerous round or oval nuclei. Their diameter is about $\frac{1}{5000}$th of an inch. In appearance they much resemble the fibers of unstriped muscle.

The *vesicular* form of nervous matter is of a dark reddish-gray color, is found only in the nervous centers, is always well supplied with capillaries, and consists essentially of nucleated cells or vesicles, which are most commonly globular or ovoidal, but often present one or more tail-like processes, when they are termed *caudate.* These caudate vesicles present great difference in shape and size. The processes are very delicate, and readily break off close to the vesicle. They probably either serve to connect distant vesicles or else become continuous with the axis cylinders of the tubular fibers.

We may now consider the way in which the nerves and nervous centers are made up of these anatomical elements.

A *nerve* is composed of a bundle of tubular fibers surrounded and connected by areolar tissue, which forms a sheath known as the *neurolemma,* whose office is to protect the delicate tubes, and to support the capillaries from which they derive their nourishment.

The *nervous centers* exhibit a union of the vesicular and fibrous textures, which may be variously arranged. In the Brain (q.v.) the vesicular matter lies externally, forming the gray or cineritious substance; in the spinal cord, on the other hand, the vesicular or gray matter lies in the central portion, and the fibrous or white matter is external to it; while in the ganglia the two structures are more or less uniformly associated.

From the observations which have been made in an earlier part of this article on the functions of individual nerves, it is sufficiently obvious that it is through the instrumentality of the nervous system that the mind influences the bodily organs, as when volition or emotion excites them to action; and that, conversely, impressions made on the organs of the body affect the mind, and excite mental perceptions through the same channel. "In this way," to quote the words of Dr. Todd, "the nervous system becomes the main agent of what has been called the life of relation; for without some channel for the transmission of the mandates of the will to the organs of motion, or some provision for the reception of those impressions which external objects are capable of exciting, the mind, thus completely isolated, could hold no communion with the external world." The nature of the connection between the mind and nervous matter is, and must ever be, the deepest mystery in physiology, and one into which the human intellect can never hope to penetrate. There are, however, many actions of the body in the production of which the mind has no share. Of this kind are the nervous actions, which are associated with the functions of organic life, such as digestion, respiration, and circulation. Again, there is another class of actions for which two nerves (an afferent or excitor, and a motor) and a nervous center are necessary. These are the actions known as *reflex* or *excito-motory*, for the full investigation of which physiology is especially indebted to the labors of the late Dr. Marshall Hall. For example, the movement of the œsophagus in propelling the food onwards to the stomach, is caused by the stimulus of the food acting on the excitor or afferent nerves, which, through the spinal cord, excites the motor or afferent nerves, and thus give rise to the necessary muscular action. When the edge of the eyelid is touched, the excitor nerve (a branch of the ophthalmic division of the fifth or trifacial nerve) conveys the impression of the stimulus to the nervous center, and the eye is at once closed by the motor influence, which is transmitted by a branch of the facial nerve to the orbicular muscle. In such cases as these—and they form a very numerous class—the mind takes no part. In some of them it is conscious of the application of the stimulus, as well as of the muscular act which follows; but even in these cases no effort of the will could modify or interrupt the sequence of the phenomena.

It has been already shown that the stimuli, by which the action of nerves is commonly excited, are of two kinds, mental and physical, and the change which these stimuli produce in a nerve develops the power known to physiologists as the *vis nervosa*, or nervous force. "The nervous force," says Dr. Sharpey, in his *Address on Physiology* in 1862, "has long been likened to electricity, but rather through a vague perception of analogy than from any rigorous comparison. It is true that electric force is developed in the nerves, and even exhibits modifications connected with different conditions of nervous action. Still, it must be borne in mind that the evolution of electricity is a common accompaniment of various processes involving chemical change, whether within the living body or in external nature; and the tendency of recent speculation is not towards the identification of the nerve force with electricity, but rather to suggest that the two stand related in the same way as electricity and other physical forces are related to each other—that is, as manifestations of a common force or energy, of which they, severally, are the special modifications." The velocity with which impressions are transmitted by the nerves has been recently made the subject of investigation, but it is doubtful how far the observations are to be depended on, in consequence of the various sources of fallacy by which such experiments are beset. According to Hirsch, the velocity is 34 meters, or about 112 ft. per second in man; while Helmholtz fixes it at 190 ft. per second in the frog.

The description of the nervous system given in the foregoing pages is applicable, with slight modifications, to all the vertebrates; the main differences being in the degree of the development of the brain—a point which has been already noticed at the commencement of the article BRAIN. For a sufficient notice of the plan of the nervous system in the invertebrate animals, the reader is referred to the articles ARTICULATED ANIMALS, MOLLUSCA, and RADIATA. It is only in the lowest subdivision of the animal kingdom, the PROTOZOA, that no traces of a nervous system can be detected.

For further information on the subject of this article, the reader is referred to Dr. Carpenter's works on *Human* and *Comparative Physiology*, to Dr. Todd's article on "The Nervous System" in *The Cyclopedia of Anatomy and Physiology*, to Todd and Bowman's *Physiological Anatomy and Physiology of Man*, and to Funke's *Lehrbuch der Physiologie*.

NERVOUS SYSTEM (*ante*). The nerve fibers have a great diversity of size; some of them found between the muscles are as much as $\frac{1}{1250}$ of an inch in diameter, having a tubular membrane, medullary contents, and an axial band. Other nerve fibers having the same structure are not more than $\frac{1}{25000}$ of an inch in diameter. Other fibers again are composed of an axial band and a medullary covering only; and still others have no other element than the axial band. The important element, and the one necessary to the conducting function, is the axis cylinder. In regard to the gelatinous nerve fibers, or the fibers of Remak, which are found, as stated in the preceding article, chiefly in the sympathetic system, there is a difference of opinion. By some physiologists they are believed to be connective tissue elements, not possessing the peculiar properties of nerves; but the predominant view is that they have peculiar nerve properties. These gelatinous fibers are particularly found in that portion of the sympathetic system connected with involuntary contraction of non-striated muscles, viz., in the gray filaments sent to these muscles, and not in the white filaments of the sympathetic, which are regarded as incapable of exciting motion. Microscopic investigation has shown that, in the development of the embryo, the first formed nerve fibers are identical with the fibers of Remak, and that the new nerve elements which are formed in the reparation of injuries are also of this character. The gelatinous nerve fibers of the sympathetic system are of a flattened form, with smooth, sharp borders, having a grayish pale color, and containing, within a sheath, numerous fine granulations, and, at intervals, oval cells or nuclei of the same diameter as the caliber of the fibers, and composed of fine granular matter, without nucleoli. The dimensions of these "nuclei" or cells are about $\frac{1}{7500}$ of an inch in their short, and $\frac{1}{1200}$ of an inch in their long diameter. The medullated nerve fibers, in passing into certain organs, such as the pacinian corpuscles (q.v.), the tactile corpuscles (see TOUCH), and some glandular structures, lose the tubular sheath and medullary investment of the axis cylinder, while nothing but the latter element composes the termination. It was formerly thought that the tubular elements also entered the pacinian corpuscle, but recent observations have led to other conclusions.

Nerve cells and their relations.—The cellular elements of the nervous system, which are regarded as the "generating elements" of nervous force, are composed of four kinds of cells—apolar, unipolar, bipolar, and multipolar; and these are of various sizes and diverse appearances. The apolar cells are rounded bodies composed principally of granular matter, and having nuclei and nucleoli. They are always present in the ganglia of the sympathetic nerve, and have been found in the cerebro-spinal centers. It is not certain that unipolar cells exist in man, but they are not uncommon in the lower animals. Bipolar cells are found in the ganglia of the posterior roots of the spinal nerves, and also in ganglia of the sympathetic. Small cells, with three and sometimes four poles or connections, are found in the posterior horn of the gray matter of the spinal cord (q.v.), while large, irregularly shaped multipolar cells with numerous prolongations are found in the anterior horns of gray matter. Some of the cells have ten or twelve poles, and have received the name of motor cells. The general anatomical elements are, however, in all these forms of cells essentially alike. Except the apolar and unipolar cells, they are of irregular shape, and have highly refracting granular contents. In adult animals there is usually but one nucleus, but the nerve cells of young animals often have multiple nuclei. The nucleoli are generally single, but sometimes they are also multiple. The size of nerve cells varies, ranging from less than $\frac{1}{1200}$ to more than $\frac{1}{300}$ of an inch in diameter. The nuclei are not so variable in size, ranging from $\frac{1}{3000}$ to $\frac{1}{1800}$ of an inch. In examining these delicate organisms with the microscope it is usual to harden the tissues with chemical substances, such as chromic acid, and make very thin sections with a sharp knife; but, notwithstanding all the care that may be taken, the precise relations between the nerve cells and nerve fibers have not been satisfactorily determined. Some of the German physiologists, among them Max Schultze, have become satisfied that multipolar cells have one prolongation unlike the rest, which is continuous with the axis cylinder of the nerve fiber, the other prolongations being of a different character, and, although branching out to a considerable extent, not connected with the nerve fibers. In tracing a nerve fiber towards its origin in the white portion of a nerve center, it is observed to lose its sheath, and consist only of an axis cylinder and investing medullary substance; the white portion of the center being composed of these simply medullated, non-sheathed fibers. When a fiber passes from these white portions into the gray substance it loses its medullary investment, and passes among the cells simply in the form of an axis cylinder; and although it is certain that many fibers are prolongations of the poles of the cells, it is not clearly made out that this is always the case.

Inhibition.—When an impulse is sent along a nerve to a nerve center, if the latter be in a quiescent or unoccupied state, it will transmit outwardly to an organ a reflex impulse. A nerve transmitting an impulse toward a center is called an *afferent*, while one which conveys an outward impression toward an organ, or toward the periphery, is called an *efferent* nerve. When, however, a nerve center is preoccupied, and an afferent impulse is sent to it, which would ordinarily be reflected along an efferent nerve, it is not so reflected, or only in a much diminished degree. This peculiar action of arresting a nervous current is called *inhibition*, and is constantly playing a most important part in the distribution of nervous force to all the different parts of the complicated animal mechanism. For example, if the central end—the end toward the brain or, to speak more definitely, toward the medulla oblongata (see BRAIN, *ante*)—of a divided pneumogastric nerve be stimulated when the respiratory center is engaged in its accustomed rhythmic action of sending out impulses of inspiration and expiration, one of two things will happen, viz.: either the respiratory movements will be slowed or stopped entirely, or they will be accelerated. One explanation of the difference of action is that the pneumogastric nerve contains among its afferent fibers two sets, which, on account of original structure or of their connections, will, in one case, stop impulses, while in the other they will be accelerated. The retarding or stopping set are called inhibitory, while the others are called accelerating fibers. It must be confessed, however, that this is simply an "explanation." The most striking instance of inhibition is offered by the heart. If the pneumogastrics be divided in an animal while the heart is beating regularly, and the outer end of the divided nerve is stimulated for a short time with the interrupted (Faradic) galvanic current, the heart will be almost instantly brought to a stand-still, and it will not resume its pulsations for some time. The beats, when they reappear, are at first feeble and infrequent, but soon reach the standard, or even go beyond it. The inhibitory action in this case has been estimated to be about .16 of a second. Other stimuli than the interrupted current may be employed, such as mechanical irritation and chemical stimuli. The action of atropine is remarkable. When injected into the blood, stimulation of the pneumogastric nerve with powerful galvanic currents will produce no inhibition. In order to understand this subject better it will be proper to say a few words about *vaso-motor nerves.* In mammals, if the cervical sympathetic nerve be divided, it will be found that the minute arteries of the head on the same side have become dilated, and that an increased amount of blood is circulating in them. If a rabbit be the subject of the experiment it will be seen that the whole ear of the side operated on will be much redder than natural. All the minute vessels, both arteries and veins, become greatly dilated and the temperature will rise more than one degree. Division of the sciatic nerve in the mammal causes a dilation of the arteries of the leg and foot, and the temperature will rise several degrees. Division of one of the splanchnic nerves (nerves arising from sympathetic ganglia in the thorax) produces dilation of the blood vessels of the intestines and other abdominal viscera. If a nerve supplying a muscle is divided, there immediately follows a considerable increase of flow of blood from the muscle, showing that its blood vessels have become dilated. The act of dilation may be easily seen with the microscope in the frog. There are, indeed, in all parts of the body certain vascular areas, which have such a relation to certain nerves that they become dilated on division of one of the nerves. These nerves are ordinarily called *vaso-motor nerves.* It is not intended by this designation to indicate that they are vaso-motor in an exclusive sense, possessing essentially different properties or structure from other nerves, but that they are nerves which have a vaso-motor function, because they are distributed to organs where vaso-motor functions can be performed. It has been a matter of discussion as to whether the origin of the vaso-motor nerves is in the spinal cord or in the sympathetic system. From their being so usually traced to sympathetic ganglia it was supposed for a time that they had a sympathetic origin, but careful researches have demonstrated their origin in the cerebro-spinal centers. One remarkable fact in regard to the vaso-motor nerves is that, although a section of their fibers produces dilation in the vessels supplied by them, irritation of the ends (peripheral) connected with these vessels does not always restore their caliber by constriction; but dilation may be increased by irritation in some cases, while constriction is produced in others.

If an animal is placed under the influence of curari (q.v.), and the central end of a divided sciatic nerve stimulated, an increase of blood-pressure will be observed, caused by the constriction of certain arteries, particularly those supplied by the splanchnic nerves; and, in general, the stimulation of any nerve containing afferent fibers will produce increase of pressure in the blood vessels, thus affording a test for the presence of afferent fibers in any nerve. If the animal is placed under the influence of chloral instead of curari, there will be a diminution of blood pressure instead of an increase on stimulation of an afferent nerve. These experiments suggest that the dilating or constricting results of stimulation depend upon the condition for the time being of the central nervous system, and this has led to the explanation of the two phenomena by means of the inhibitory nervous functions. This explanation, however, seems to fail in those cases where irritation of the peripheral end of a divided nerve produces either dilation or constriction, according to circumstances. Therefore, it has been supposed that there are vaso-motor nerves which have a dilating, and others which have a constricting, function. An interesting example is afforded by the submaxillary gland, which is supplied with two nerves, one being distributed to the salivary duct and its branches, and the other to the blood vessels. No marked effect is produced by simple section of either nerve, but when they are stimulated remarkable results follow, the ducts of the gland becoming greatly dilated, while the arteries are in an equal degree contracted. A question as to whether there is a vaso-motor center has for some time been a subject of investigation, but no definite conclusions have been obtained. Experiments show that the medulla oblongata, which is the center of so many reflex actions, is also a center of a large number of reflex vaso-motor functions, but it is also found that various parts of the spinal cord are centers of reflex vaso-motor functions; and it is probable that vaso-motor action is connected with an arrangement of nerve fibers and centers similar to that of the general reflex system. Whether there are automatic vaso-motor centers, those in which impulses are generated independently of reflex action, has not been determined, but it is probable that there are, if we consider the effects of certain emotions, such as blushing and pallor.

The pneumogastric nerve (see NERVOUS SYSTEM, *ante*) has the most remarkable course, the greatest number of connections, and the most varied functions of any of the cranial nerves. It arises in the medulla oblongata by a purely sensory root, but communicates with five motor nerves in its course, and is distributed extensively to muscular tissue both of the voluntary and involuntary kind, to striated muscles and to non-striated, whether belonging to blood vessels, intestinal walls, or glandular ducts. It presents two ganglionic enlargements in its course—one at its exit from the cranial cavity by the jugular foramen, which is called the ganglion of the root; the other, a grayish enlargement, from half an inch to an inch in length, called the ganglion of the trunk. It is a plexiform structure, composed mainly of white and gray fibers and nerve cells. The most important communication, or addition, which the pneumogastric receives is a branch from the spinal accessory, for it has been shown that the larynx is supplied by filaments derived from this branch. Other communications are received between the root and the ganglion of the trunk, the most important of which are those from the superior cervical ganglion of the sympathetic. The filaments are short, and bind the sympathetic ganglion to the trunk of the nerve. Other filaments are received from other sympathetic ganglia, so that the pneumogastric becomes a mixture of sympathetic and cerebro-spinal nerves. What mysterious purpose is served by this mingling is not known; probably qualities are given to the nervous influence of certain fibers, similar to those which are sometimes produced in galvano-electric machines by certain combinations of conductors and magnets, producing variations in intensity or in quantity, and also, perhaps, other qualities which are unknown. The most important branches of the sympathetic are: 1, auricular; 2, pharyngeal; 3, superior laryngeal; 4, inferior laryngeal; 5, cardiac; 6, pulmonary; 7, esophageal; 8, abdominal. The pneumogastrics are generally alike in their distribution in either side of the body, with the exception of the inferior laryngeal and abdominal branches. Passing by the differences in the former, it may be stated here that the left abdominal branch supplies innervation to the muscular walls and the mucous membrane of the stomach; numerous branches also supplying the liver, in its course anastomosing with branches of the right abdominal and of the sympathetic. The right pneumogastric, which is situated more posteriorly, sends a few filaments to the stomach, but is principally distributed to the liver, spleen, kidneys, supra-venal capsules, and (the most important difference) to the whole of the small intestine. Before the nerves pass to the intestines, however, there is a free interchange of fibers between the left and right abdominal branches.

NESHO'BA, a co. in e. Mississippi, intersected in the n. by the Pearl river; 573 sq.m.; pop. '80, 8,741—8,713 of American birth. Its surface is hilly, a large proportion covered with forests and uncultivated. The soil is fertile, and especially in the n. yields good crops of cotton, corn, wool, sweet potatoes, tobacco, and sorghum. Much attention is given to stock-raising, and large numbers of cattle, sheep, and swine are raised. Co. seat, Philadelphia Court-House.

NESS (identical with Eng. *nose*, A.-S. *nose*, Ger. *nase*, Ice. *nes*, Lat. *nasus*, Fr. *nez*), a geographical termination, signifying promontory. Names in *-ness* abound among the Orkney and Shetland islands, and on the coast of Caithness; and they occur, though less frequently, along the e. coast of Great Britain, as far as Dungeness in Kent. As the corresponding Scandinavian termination *-naes* prevails in the names of promontories in Norway, Sweden, and Denmark (e.g., Lindesnaes, in s. of Norway), the existence of names in -ness in Britain is held as an evidence of Scandinavian and Danish colonization. Grisnez, on the n. coast of France, points to the same source.

NESS, a co. in central Kansas, drained by the North fork, the South fork, and Walnut creek, all affluents of the Arkansas river; 900 sq.m.; pop. '80, 3,722—3,422 of American birth, 2,186 colored. Its surface is mostly prairie land, furnishing good pasturage for cattle all the year round, and sheep are extensively raised. Its soil is productive, and it is thinly timbered. Co. seat, Ness Court-House.

NESS, Loch, a long narrow lake in Inverness-shire, Scotland, extends n.e. and s.w., and is 23 m. in length, and 1½ m. in average breadth. Its n.e. extremity reaches a point 6 m. s.w. of the town of Inverness. It receives the Morriston, the Oich, the Foyers, and other streams, and its surplus waters are carried off to the Moray firth by the river Ness. It lies in the valley of Glenmore, and is inclosed by mountain masses averaging 1000 ft. in height; but the scenery on its banks is not strikingly picturesque. In many places it is about 180 fathoms in depth, and owing to the length of time which this immense body of water takes to cool down to the freezing point, ice never forms to any considerable extent.

NESSELRODE, Karl Rob., Count, one of the most eminent diplomatists of modern times, was b. Dec. 14, 1780, at Lisbon, where his father, a descendant of an ancient noble family on the lower Rhine, was then Russian ambassador. He early devoted himself to a diplomatic career, gained in a high degree the esteem and confidence of the emperor Alexander, and in 1813 was one of the representatives of Russia in the important negotiations which took place between the powers who combined against France. In 1814 he accompanied the Russian emperor to France, and on Mar. 1 signed the treaty of the quadruple alliance at Chaumont. He was also one of those who concluded the treaty with marshal Marmont for the surrender of Paris. He continued to take a principal part in all the negotiations which ended in the peace of Paris; and was one of the most prominent and active of the plenipotentiaries in the congress of Vienna. He was one of the most active diplomatists of the holy alliance, and accompanied the emperor Alexander to the congresses of Aix-la-Chapelle, Troppau, Laibach, and Verona. The emperor Nicholas reposed in him the same confidence, and under his reign he conducted the Russian policy in the affairs of Greece and Turkey. Amidst the European convulsions of 1848 and 1849, Russia, under his guidance, refrained from interference, till opportunity occurred of dealing a deadly blow to the revolutionary cause in Hungary; and, at the same time, of bringing Austria very much under Russian influence. Being one of the chiefs of the German or moderate party in Russia, Nesselrode is supposed to have exerted himself strenuously to preserve peace with the western powers; and after the war had broken out in 1854, and the ill success of Russia was manifest, he undoubtedly strove for the re-establishment of peace, and for the assembling of a congress to settle all disputes. After the accession of Alexander II. he retired from the direction of foreign affairs, and was succeeded in that department by prince Alexander Gortchakov, but retained the dignity of chancellor of the empire, and a seat in the ministerial council. He died at St. Petersburg, Mar. 23, 1862.

NESSUS, in Greek mythology, a centaur who carried travelers over the river Evenus, and who insulted Deïanara, the wife of Hercules, and was killed by the latter. In revenge he told the woman to collect the blood from his wound and use it as a love philter, and when she afterwards poured it on Hercules's tunic, the poison communicated to the blood by the arrow dipped in the hydra's venom so tortured the hero that he sought death on a funeral pile. Hence the use of the word to denote a fatal present or that from which there is no escape, as "the Nessus-shirt of ridicule," (Rénan).

NEST-BUILDING APES. Reference was made, but with some hesitation, in the article GORILLA, to certain new species of apes of the same genus with the chimpanzee and gorilla, said to have been discovered by M. du Chaillu in western Africa. The complete vindication which has since taken place of that traveler's reputation as a truthful and trustworthy observer, makes it necessary to give some further notice of these now unquestioned discoveries, exceedingly remarkable on account of the habits of some of the animals. To protect themselves from the rain, they construct nests, or rather umbrellas, among the branches of the trees, of long branches and leaves laid one over the other very carefully and thickly, so as to be "capable of shedding water." The branches are fastened to the tree in the middle of the structure by portions of the stems of twining shrubs, abundant in these forests. When the leaves dry, so that the structure no longer keeps out the rain, the owner builds another shelter; and Du Chaillu says this happens once in ten or fifteen days. The nest-building ape (*troglodytes calvus*, called nshiego mbouve by the natives) is nearly four feet in length. Du Chaillu supposes this ape to rest all night on a projecting branch under its nest or umbrella, with an arm round the stem of the tree for security. The nests are generally constructed about 15 or 20 ft. from the ground, and invariably on a tree which stands a little apart from others, and which has no limbs below the one in which the nest is placed, probably in order to insure safety from serpents and other animals. These apes inhabit the most lonely parts of the forests. The nests are never congregated together, so that this ape does not seem to be gregarious. It feeds on fruits.—Du Chaillu discovered a second species of nest-building ape on his second visit to the Ogobai, very similar to the *troglodytes calvus*, but which constructs its nest in a somewhat different fashion. It is called nshiego nkengo by the natives. It makes its nest or shelter at the height of about 20 or 30 ft. from the ground, by bending over and intertwining a number of the weaker boughs, the foliage of which forms its protection from rain.

NES'TOR, according to ancient Grecian legend, the son of Neleus and Chloris, b. in the Messenian Pylos, escaped destruction when Hercules slew all his brothers, being then a dweller among the Geronians, with whom he was brought up. He married Eurydice, by whom he became the father of a numerous family. In his youth he was distinguished for valor in wars with the Arcadians, Eleians, and the centaurs, and in his advanced age for wisdom. Although he was an old man when the expedition against Troy was undertaken, he joined it with his Pylians in sixty ships. Homer makes him the great counselor of the Grecian chiefs, and extols his eloquence as superior even to that of Ulysses. His authority was even considered equal to that of the immortal gods. Nestor returned in safety to his own dominions after the fall of Troy, along with Menelaus and Diomedes, and continued for long to rule over the people of Pylos.

NESTOR, 1056–1114; b. Russia; entered a convent at Kiev in 1072. He wrote, in the old Slavic dialect, the chronicles of Russia, from about 850 to his own times.

NESTO'RIANS, a sect of the 5th c., so called from its founder NESTORIUS, under which head their distinctive doctrine, as well as their history up to the time of its condemnation, are sufficiently detailed. Of the later history it will be enough to say that, even after the council of Ephesus, Nestorianism prevailed in Assyria and Persia, chiefly through the influence of the well-known school of Edessa. Although vigorously repressed in the Roman empire, it was protected, and probably the more on that account, by the Persians, and ultimately was established by king Pherozes as the national church, with a patriarch resident at Seleucia; its fundamental doctrine as laid down in the synod of Seleucia in 496, being the existence of two distinct persons as Christ, united solely by a unity of will and affection. Under the rule of the caliphs, the Nestorians enjoyed considerable protection, and throughout the countries of the east their community extended itself. Of their condition in central Asia, during the mediæval period, some account will be found under the head of PRESTER JOHN. In the middle of the 12th c., their church reckoned no fewer than 90 bishops under regular metropolitans, together with 56 others, whose special dependencies are unknown; but in the destructive career of Tamerlane, they shared the common fate of all the representatives of the eastern civilization. In the 16th c. a great schism took place in this body, of which a portion renounced their distinctive doctrine, and placed themselves under the jurisdiction of the Roman pontiff, to whom, under the title of Chaldean Christians, they have since remained faithful. The others still maintain their old creed and their ancient organization. Their chief seat is in the mountain ranges of Kurdistan. They are at present a poor and illiterate race, numbering about 140,000, and subject to a patriarch residing at Diz (who is always chosen from the same family, and takes invariably the name of Schamun, or Simon) and 18 bishops. All these are bound to observe celibacy, but marriage is permitted to the priests and inferior clergy. Their liturgical books recognize seven sacraments, but confession is infrequent, if not altogether disused. Marriage is dissoluble by the sentence of the patriarch; communion is administered in both kinds; and although the language of the liturgy plainly implies the belief of transubstantiation, yet, according to Layard, that doctrine is not popularly held among them. The fasts are strict and of very long duration, amounting to very nearly one-half of the entire year. They pray for the dead, but are said to reject the notion of purgatory, and the only sacred image which they use or reverence is that of the cross. The Nestorians of Kurdistan, like the Christians of the Lebanon, have suffered much from time to time through the fanaticism of the wild tribes among whom they reside. In a massacre in 1843, and again in 1846, many fell victims, and even still they owe much of their security to the influence exercised in their favor by the foreign representatives at the Turkish and Persian courts.

There is another body of Nestorians who have existed in India from the period of the early migrations of the sect, and who are called by the name of Syrian Christians, Their chief seat is in Travancore, where they number about 100,000. Among both bodies of Nestorians, European missionaries, Catholic and Protestant, have of late years endeavored to effect an entrance. See Perkins's *Residence of Eight Years in Persia among the Nestorian Christians* (Andover, 1843); Anderson's *Oriental Churches* (1872); and Dean Stanley's *History of the Eastern Church.*

NESTORIANS (*ante*) claim to have existed as a sect prior to Nestorius, and date their conversion to the preaching of the apostle Thomas. They have also a tradition that they are descended from the patriarch Abraham, and hence are sometime called Chaldeans. It is admitted that they are the oldest of the oriental Christian sects. And though they have some superstitions and doctrinal errors, yet they retain many of the doctrines and authorized usages of the early church of Christ. Notwithstanding the deposition of Nestorius, his writings and those of Theodore of Mopsuestia were translated into Syriac, were circulated in Assyria and Persia; and made many converts. When emperor Theodosius II. expelled from his dominions all who refused to accept the Ephesian decision, Nestorianism was transferred to those countries where it has held its ground to the present day. In 435 was established the famous school of Edessa, and from it went many disciples of the new doctrine. Of these the most celebrated was Barsumas, bishop of Nisibis, who did much to propagate Nestorian views in Persia. He and Maanes, bishop of Ardaschir, prevailed upon the Persian king Feroze to expel those Christians who favored the decision of Ephesus, and establish the Nestorians as the national church for the Christians in Persia. Thus patronized by the state, they made Seleucia the seat of their patriarchate, which from that time to the present has been held by the patriarch of the Nestorians. They also established a theological seminary at Nisibis. So great were the zeal and success of Barsumas that the Nestorians now in Chaldea, Persia, Assyria, and the adjacent countries, regard him as their founder. Mosheim says, "It appears from unquestionable documents still existing that there were numerous societies in all parts of Persia, in India, in Armenia, in Arabia, in Syria, and in other countries under the jurisdiction of the patriarch of Seleucia during the 6th century." Of the 7th c., he says, "The Christian religion was in this century diffused beyond its former bounds, both in the eastern and western countries. In the east the Nestorians, with incredible industry and perseverance, labored to propagate it from Persia, Syria, and India, among the barbarous and savage nations inhabiting the deserts and the remotest shores of Asia. In particular the vast empire of China was enlightened by their zeal and industry with the light of Christianity." Considering it necessary to express fully their views, a system of doctrine was adopted at a synod convened by the patriarch Badæus in 496 at Seleucia. The characteristics of this were that in Christ there were two persons, the divine Logos, and the man Jesus; that these two hypostases had only one outward appearance; that the union between the Son of God and the Son of man took place at the moment of the Virgin's conception, and is never to be dissolved; that these two persons are united by no other connection than that of will and affection; that Christ on that account ought to be clearly distinguished from God; that Mary is to be called the mother of Christ, *Christotokos*, and not the mother of God, *Theotokos*. They asserted also that these tenets had not been derived from Nestorius, but had been held by the church from the beginning. Another peculiar opinion was that it was lawful for bishops and presbyters to marry. At the end of Cavades's reign in the 6th c., a schism occured among the Nestorians, which lasted 12 years, when two patriarchs, Nerses and Elisæus, were elected by the opposing factions, each of whom appointed bishops from his own followers. After the death of Nerses in prison and the deposition of Elisæus, the bishops elected Mar Aba I., or *the great*, a Magian convert, 536–552. He translated the liturgy of the Nestorians from the Greek into Syriac, making the version now in use among the Nestorians. He was very active in restoring discipline in the church, and held a synod in 544 which declared that the patriarchs and bishops should thenceforth not be allowed to marry, a regulation ever since observed. He also ordered that while conforming to the Nicene creed, the system of Theodore of Mopsuestia should form the basis of biblical interpretation. Nestorianism was regarded with favor, or at least with toleration under the Saracens, Arabs, and Tartars, the successive masters of Persia. The Nestorians spread not only in Arabia, Syria, and Palestine, but under Mar Aba II., 742–752, a bishop was appointed for them in Egypt. He was subject to the see of Damascus: in later times they had a metropolitan of Egypt. After Bagdad became the abode of the caliphs the patriarch also resided there in A.D. 762. The patriarch was called *yazelich*. i.e. *catholicos*, and in the 13th c., he had 25 metropolitans under his supervision. A historian says: "The Nestorians had now become widely extended. They occupied almost to the exclusion of other Christian sects the region which forms the modern kingdom of Persia, in all parts of which they had churches. They were numerous in Armenia, Mesopotamia, and Arabia. They had churches in Syria and in the island of Cyprus. They had churches among the mountains of Malabar in India. They had numerous churches in the vast region of Tartary from the Caspian sea to mount Imaus, and beyond, through the greater part of what is now known as Chinese Tartary, and even in China itself." Early in the 11th c. Unkh Khan, a Tartar prince on the northern borders of China, invited Nestorian missionaries among his people, and himself became the famous Prester John. Genghis Khan and several of his sons and grandsons, who conquered China and almost all Asia and a part of Europe, were connected with Prester John by marriage. Several of them had Christian wives, and one of them professed himself a Christian. Under some of this dynasty central Asia was comparatively civilized and enlightened; and Christian travelers passed with safety from the banks of the Euphrates to Samarcand and Pekin. Some of the Chinese emperors favored Christianity and ordered the erection of numerous churches. Meanwhile the sword of Moslem fanaticism advancing eastward Bagdad fell before it, and all the country on the Euphrates, then Persia and the regions to the north. The Nestorian church was crushed, and its missions languished; and about the year 1400 Tamerlane swept like a whirlwind over the remains of Nestorian Christianity. The missions in China languished for want of support, and were weakened by controversies with missionaries from Rome; but some of the churches still existed, and in 1502 four bishops were sent to China.

In 1551 a dispute arose among the Nestorians concerning the election of a patriarch. One party elected Bar Mama; the other, who chose Sulaka, placed themselves under the Roman pontificate, and called themselves Chaldean Christians. Sulaka was sent to Rome to be ordained, but on his return he was made prisoner in Amid, and killed in prison. Another was appointed in his place. In 1684 pope Innocent XI. appointed a patriarch, who resided in Diarbekir, and took the name of Joseph, which is retained by his successors. The number of Chaldean Christians is about 20,000, scattered from Diarbekir to the frontiers of Persia and from the borders of Tyari to Bagdad—a district which once contained a vast number of Nestorians. This portion of the Nestorians is governed by a patriarch and six bishops, who have lately been pensioned by the propaganda. They have no independent existence, but are a section of the Roman church. They have no standard confession of faith. The patriarch of the other party is called Simeon, and resides in the mountains of Kurdistan. These are the two representatives of the primitive Nestorian church in Persia.

The Syrian or Nestorian Christians of St. Thomas profess to be his disciples, and say that he preached the gospel in Malabar and other parts of India. However that may be, there is evidence that the Syrian or Nestorian churches in Malabar were founded as early as the 5th or 6th century. The first notices of this people in recent times are found in Portuguese histories. When they arrived in India in A.D. 1500, they found not only a Christian king, but many professing Christians, and more than 100 churches. The popes claiming universal spiritual supremacy endeavored to bring them into subjection, and directed the Portuguese to use all their power to convert them. In 1545 a Franciscan friar was sent out who opened schools to educate the youth in the doctrines of their church. The Syrian bishop, Mar Joseph, was taken a prisoner to Goa, and thence sent to Portugal. Mosheim says, "The finishing stroke was put to the violence and brutality of these attempts by Don Alexis de Menezes, archbishop of Goa, who at the close of the 16th century, calling the Jesuits to his assistance, compelled this unhappy people to embrace the religion of Rome, and to acknowledge the pope's supreme jurisdiction." The result of these efforts was that the priests and churches on the sea-coast submitted to the pope, insisting, however, on retaining their language and liturgy. These are called the *Syrio-Roman Christians*. But those in the interior would not yield. After a brief show of submission they proclaimed war against the inquisition, hid their books, fled to the mountains, and sought the protection of the native princes. These retain their ancient rites, liturgy, and ministry, and are called by their former name *the Syrian Christians of Malabar*. Little was known concerning them in Europe and America until Dr. Buchanan published his account of them in 1807. He found near Travancore the Syrian metropolitan and his clergy, and there were 55 churches. They used the liturgy of Antioch in the Syrian language. They had many old and valuable copies of the Scriptures, one of which, a Syrian manuscript of great antiquity they presented to him. He describes their doctrines as few in number, but agreeing in essential points with those of the church of England. The church missionary society subsequently had a mission among them, but without much success. The Syrio-Roman Christians are said to number about 100,000, the others 50,000.

In 1830 Messrs. Smith and Dwight, missionaries of the American board, visited the Nestorians of Persia. From their *Researches* we learn that they occupy a wild range of the Koordish mountains on the borders of Turkey and Persia. They are governed by *meliks* or kings chosen from their own people by a popular vote. Every melik or head of a small clan is perfectly independent, except as they yield a voluntary obedience to their patriarch, Mar Simon, who resides near Joolamerk, and styles himself "patriarch of the East." The Turkish government has long sought to subdue them. They are very poor, and in the summer many descend to the plain of Oroomiah at the foot of the Kurdistan range, where now dwell a large body of Nestorians, numbering about 40,000. They are bold, generous, and kind. The patriarch professes only spiritual power, but among the mountaineers his word is law in all things. He seldom visits those of Oroomiah. Under him are 18 bishops, 4 of whom reside in Oroomiah. Celibacy is not required of the inferior clergy, who generally are poor, eking out a living by cultivating the ground, or teaching a few scholars. Some of them can scarcely read, but they have improved since the distribution freely among them of the Syriac bible. Religion is very low. Lying, intemperance, profanity, and some other vices, are common. Sunday is a holiday. Roman Catholic agents seek to seduce the Nestorian Christians, and even the patriarchs, to submission to the pope. A Jesuit a few years ago offered the patriarch $10,000 if he would acknowledge the Roman supremacy. The Mohammedans also endeavor to proselyte. These poor people are greatly oppressed with taxes, and are the victims of spoliation, and have no redress even in the courts. A Nestorian is not allowed a place in the bazaar, cannot engage in commerce, and in the mechanic arts cannot rise to a higher position than that of a mason or carpenter. In 1843 they rebelled and a general massacre took place. The Nestorians acknowledge the supreme authority of the Holy Scriptures, and hold that no doctrine or practice is essential to salvation, which cannot be proved from them. They have no pictures or images in their churches. The only symbol among them is a plain Greek cross, which they highly venerate.

In efforts to reach pagan and Mohammedan people with Christian truth, it is often found that the remnants of ancient Christian churches existing among them, and sometimes in political subjection to them, have substituted the forms of religion for its reality, and are in almost as much need of enlightenment as those by whom they are overborne. It has seemed that the renewal of those churches in moral and spiritual life, would provide the best means of Christianizing the races with whom they are in contact. With these aims the rev. Mr. Perkins and his wife were sent in 1833 by the American board to Persia to begin mission work among the Nestorians. Dr. Grant and his wife joined them in 1835. The bishops and priests of the Nestorian church for the most part received the missionaries cordially, and encouraged their efforts for the reformation, admitting that their people had wandered far from the right way. They even in some instances put themselves under instruction, and prepared to co-operate with them, following their example in giving expositions of Scripture, which they had never ceased to consider the ultimate standard of truth. Mrs. Grant by her school awakened great interest in the education of women. Dr. Grant not only was highly useful as a physician and surgeon, but gained great influence for the truth through this means. A boarding school for girls under the care of Miss Fidelia Fisk and a high school for boys under that of professor Stoddard, where hundreds of young men and women have received Christian training, have been highly useful. The Mohammedans seeing what was undertaken for the Nestorians, said, "Are we to be passed by," and claimed a share in the generous labors of the missionaries. Eighteen ordained missionaries and their wives, 3 missionary physicians and the wives of two of them, and 1 male and 8 female assistant missionaries, have been employed in this work, and the success has been most gratifying. They had no printed Scriptures, now they have the Bible in both the ancient and vernacular. Spelling-books, geographies, arithmetics, and religious books, in all, 11,000 volumes have been printed, and 3 periodicals are circulated. Far and wide oral Christian instruction has been given. The benefit of spiritual religion is evinced in the daily life of many, and their example makes a most favorable impression. Seventy have become preachers of the gospel. The missionary spirit is growing, and several hundred dollars are contributed annually to carry the gospel to other peoples, the Nestorians themselves engaging in this work, and laboring among Moslems, Jews, Armenians, and Malakans of Russia. One of these Nestorian preachers has gained among the latter 1200 converts. Five are pastors of self-supporting churches. It was not the design of the American missionaries to interfere with the established church organizations, but there have been formed "reunions on the apostolic basis," which include 767 members.

NESTO'RIUS, a native of Germanicia, a city of northern Syria, in the patriarchate of Antioch, was probably a disciple of the celebrated Theodore of Mopsuestia; and having received priest's orders at Antioch, became so eminent for his fluency, if not eloquence, as a preacher, and for grave demeanor and exemplary life, that on occasion of a dispute about the election of a patriarch of Constantinople he was selected by the emperor, in 428 A.D., to fill the vacant see. Soon after his consecration a controversy arose as to the divine and human natures of our Lord, in which Nestorius took a leading part. One of the priests, who followed Nestorius to Constantinople, Anastasius, having in a sermon, which was by some ascribed to Nestorius himself, denied that the virgin Mary could be truly called the "mother of God," being only in truth the mother of the man Christ, Nestorius warmly defended Anastasius, espoused this view, and elaborated it into the theory which has since been known by his name, and which equivalently, if not in formal terms, exaggerated the distinction of two natures in our Lord into a distinction of two persons—the human person of Christ and the Divine Person of the Word. An animated controversy ensued, which extended from Constantinople to the other patriarchates, and drew from Cyril, patriarch of Alexandria, a formal condemnation of the doctrine of Nestorius in twelve anathemas, still preserved, and a similar condemnation, accompanied by a threat of deposition and excommunication, from Celestine, bishop of Rome, unless he would withdraw the obnoxious doctrine. Nestorius remaining firm in his opinions, a general council was convened at Ephesus in 431, at which Cyril took the most active and prominent part, and in which, notwithstanding the absence of the patriarch of Antioch and his bishops, Nestorius was condemned and deposed. Considerable opposition was offered to this judgment for a time, but ultimately Nestorius was confined in a monastery near Constantinople, whence, after four years, still persisting in his views, he was banished to the greater oasis in upper Egypt, and after several changes of his place of confinement, died in exile. The account given by Evageius, that his death was caused by a disease in which his tongue was eaten by worms, rests, according to Evageius himself, on a single and unnamed authority. The more probable narratives ascribe his death to the effects of a fall. The date of this event is uncertain. It was after 439, when Socrates wrote his history (*Hist. Ecc.* vii. 34), but there is little doubt that he was already dead in 450, when the Eutychian controversy first began to attract notice.

NESTS (Lat. *nidus*, Gael. *nead;* allied to Ger. *nähen*, Sax. *nestan*, Lat. *nectere*, to sew, bind, or tie) are the structures which animals prepare for the rearing of their young. They are very different, not only when the creatures which construct them belong to widely separated divisions of the animal kingdom, but often when the animals are of the same class, or even when they are nearly allied; and whilst some construct very simple nests, and those of others are very curious and elaborately framed, some make no nest at all. Among MAMMALS the only nest-builders are certain rodents, as mice, dormice, squirrels, etc. The structures of some of the species are as artfully contrived and as beautiful as the nests of birds. It is among BIRDS that nest-making is most general; although there are not a few species which merely scrape a hole in the ground, and many sea-fowls lay their eggs on ledges of naked rock. The situations chosen by birds for their nests are very various, each species affecting some particular kind of situation, as each species also exhibits a uniformity in choice of materials and in form and mode of structure; these particulars, however, being all liable to modification—within certain limits—according to circumstances. Some birds' nests consist merely of a few straws or leaves collected together; some of such materials as twigs, straws, moss, hair, etc., very nicely interwoven, and often with a lining finer than the frame-work; some, as those of swallows, are made of clay or other soft material, which hardens as it dries. Birds' nests are generally open at top, but some, as those of swallows, are so placed under a projection of rock or of a building as to be covered, and have the opening at the side; whilst others are vaulted, and have the opening at the side. Some are situated in holes excavated in clayey, loamy, or sandy banks. The nests of troupials, baltimores, weaver-birds, etc., are remarkable for the ingenious contrivance displayed in them; and a very singular nest is that of the tailor-bird, made by sewing together the edges of leaves. These are noticed in the articles on these birds. Many birds are as solitary as possible in their nidification; whilst others, as rooks and herons, congregate in large communities.—No REPTILES are known to construct nests; their utmost approach to it being to make a hole for their eggs in sand, or in some other suitable situation.—The nests of FISHES have recently attracted much attention of naturalists. It is supposed that the ancients were acquainted with the nest-building instinct of some fishes; but it was unknown to modern naturalists till 1838, when Mr. Edwards discovered it in a species of stickleback (q.v.). It now gives interest to many a fresh-water aquarium. Not many fishes are yet known as nest-builders. Among them are gobies and the goramy. Many are known not to construct nests. The salmon and others exhibit an approach to the nest-building habit in making a place for their eggs in the sand or gravel which they choose for a spawning-bed.—Many INSECTS—a small proportion, however, of the whole number, and mostly *hymenoptera*—construct nests, as bees, wasps, and ants. The nests of the social bees and wasps are also their ordinary habitations, but the nests of solitary bees are entirely devoted to their young. A few insects, not hymenopterous, as some weevils, may also be said to make nests; but among insects provision for the wants of the young is usually made in very different ways. Certain spiders, amongst which may be named the water-spider, construct nests.—The instinct of nest-making, connected as it is with the instinctive care for their young which the Creator has made so important a part of the nature of so many animals, is by no means an index either of that care or of the affection with which, in many cases, it is conjoined; and some of the animals which construct no nest are among those in which affection for their young is exhibited in the highest degree.—The nest-making instincts of animals seem to be a very essential part of their constitution; and even in the most perfect domestication are still retained and exhibited; although the accommodation to circumstances which is also manifested shows something—and that not inconsiderable—of reason.

NESTS. This subject is usually confined to the nests of birds, and most notices are based on *The Architecture of Birds* (Charles Knight, London, 1831), the original observations in which are by professor J. Rennie. The subjects of his treatment include ground-nesters, squatters, and miners; builders of mounds, of umbrellas, of domes; masons; carpenters; platform-makers; basket-makers; weavers; tailors; felters; cementers. But if we look at these divisions from the point of scientific classification, it will immediately be seen that the shape, size, and locality of the nest of any given species depend on its capacities, which will appear in its beak, wings, and claws; and on its habits, which may have been modified by a thousand considerations of climate, of companionship, or imitation. General influences as to the practice of particular species may be best drawn by the following classification, based on Cuvier, but partly Reichenbach, partly Willoughby.

1. Robbers	*a.* Swoopers.	Eagles, hawks, vultures.
	b. Stealers.	Owls, etc., etc.
2. Climbers	Woodpeckers.	Parrots, etc.
3. Scratchers	*a.* Perchers.	Doves, etc.
	b. Roosters.	Domestic fowl, partridge, etc.
4. Songsters	*a.* Pinchers.	Fly-catchers, warblers, etc.
	b. Swallowers.	Goat-suckers, swallows.
	c. Crackers.	Larks, linnets, rooks.
	d. Suckers.	Hoopoes, humming-birds, etc.
5. Stalkers	*a.* Runners.	Ostrich, emu, etc.
	b. Walkers.	Bustards, plovers, etc.
	c. Fishers.	Herons, storks, cranes.
	d. Pryers.	Curlews, snipe, woodcock, etc.
	e. Scooters.	Rails, coots, flamingoes, etc.
6. Swimmers	*a.* Divers.	Auks, penguins, etc.
	b. Hoverers.	Petrels, gulls, cormorants, albatross, etc.
	c. Waddlers.	Swans, geese, ducks.

But the desire of birds to build nests corresponds to that of men to make houses, or beasts to construct lairs. They are a shelter for the young, or a refuge for the old; as with mammals, the higher the order of intelligence, the more protection is needed by the young, so that the young eagle must have its food torn up for the first few weeks, while the young ostrich scuttles out of the sand almost ready to take care of itself from birth. Nor do birds' nests differ in shape, material, or adjustment from the works of insects, beasts, even crustaceans. The following is a summary of nest-builders, disregarding the minute divisions of the list of Rennie:

First, *Burrowers.*—First of mammals is the mole, so voracious, active, and fierce that if the creature had the size of one of the tropical *feræ*, it may be questioned whether any animal has existed which could conquer it. The burrow is most complex of all, and the nest separate from the house. Then come shrews and musk-rats, the fox, all the weasels and badgers, chip-squirrels and woodchucks, and the rabbit. All have a distinct nest within the hole, and generally means of escape by extra passages. Burrowing birds: The sand-martin, the kingfisher, puffins, jackdaws, and sheldrakes; the stormy petrel, like all fish-eating birds, living in the midst of filth and stench; woodpeckers, the starlings and the creepers; the toucan, large of beak but small of strength, unable to excavate its hole in the knot of a tree. Reptiles, tortoises, crocodiles, and snakes, with all the crab kind of crustaceans, and the whole horde of boring mollusks. Scorpions and spiders, who have tunnels, towers, and trap-doors; insects, beetles, including the curious mole-cricket and the ant-lion; and all the numberless insects that bore into every article not made of metal or stone.

Second, *Hang-nests.*—The beautiful little harvest-mouse, one of the smallest mammals in the world, builds a true pensile nest, round, and, curiously enough, without opening. So does the squirrel, when he hangs his summer nest (for he makes two) from the end of some slender bough, but these are almost the only animals light and active enough to rival the birds in this peculiar industry. Hanging-nests of all shapes—bottles, scoops, extinguishers; with tails, with concealed openings—belong in enormous variety to the tropical species; and in this country we all know the humming-birds, the orioles, the fly-catchers, and all the warblers. Among insects the best-known are the wasps; but many ants, the moths, and some spiders come into this category. There is one fish, but it seems wrong to include here the pupæ of insects.

Passing to the creatures which build, rather than burrow or weave, we have: Building mammals. Two Australian species only and our own musk-rat; but the birds are very numerous. The oven-bird, the blackbird, and the song-thrush, martins of all kinds, swallows of all kinds, the curious birds of Australia which hatch their eggs in mounds of rotting leaves and twigs; the titmice, wrens, the eastern lyre and bower birds. Among insects we have white ants and mud-building wasps. But a whole class of buildings may be separated and called sub-aquatic. Here belong fishes, the little stickleback and the hassar; but the most wonderful of all such creations may be seen in the depths of a pool. The water-spiders, caddis-flies, all pupa-cases and larvæ-nests; and here may be added corals, serpulæ and terebellæ. Social habitations, communities of creatures, whether all of the same species or mixed, by sufferance and by intrusion, are very common. The beaver, emblem of quietness and industry, is an example from mammals; but in birds we have the curious sociable-weaver of South Africa. Among insects, bees, hornets, some moths, some butterflies, and several curious kinds of ants, mostly from Africa. Parasitic nests, inhabited by the cuckoo and the cow-birds, the sparrow-hawk and the kestrel, crow-blackbirds, occasionally the sparrow and the stork. Among insects, whole families of flies pursue the luckless moths and caterpillars, making of their cocoons, or their living bodies, nests for the generation of a swarm of destroyers. Here come most of the gall-insects, the leaf-miners, and the parasite breeze-flies, and the curious companion of the snail, the drilus. Branch-builders are represented, as may be imagined, mostly by birds, yet we have among animals the dormouse and the loir; among birds, rooks, crows, herons, all finches, the eagle, the chat, the mocking-bird, the water-hen, some warblers, some humming-birds, some shrikes, and the hedge-sparrow. These all make open, usually round nests, on the fork of a branch, and woven of twigs or of miscellaneous trash. Here come also some spiders, many moths, and several species of strange nest-building insects. To sum up, a nest, visibly so, and for that purpose only, strikes us more commonly in birds than elsewhere, though upwards of one-half of them make no nest, and many others steal places already fitted to their use; but the fact is, many mammals have distinct and real nests; crustaceans and reptiles commonly construct them, and they are and must be the rule with all insects when undergoing the changes necessary to their development.

NESTS, Edible, an important article of commerce between the eastern islands and China, and of luxury in China, are the nests of several species of swallow (q.v.), of the genus *collocalia*. The best known of these birds, *C. esculenta*, is about 4½ in. in length, 11 in. expanse of wing, dusky black above, pale ash-color beneath. The nest is shaped like that of the common swallow, and adheres to a rock; vast numbers being found together—often in absolute contiguity—in caves of the eastern archipelago; as those of the same and allied species are in other islands of the East Indies. The nests themselves are formed of grass, sea-weed fibers, small leaves, etc., and are attached to the rock by a sort of bracket, made of a gelatinous substance, which is the part really eaten. This was formerly thought to be made of sea-weeds, but is now known to consist of saliva, which the swallow exudes from the salivary glands under the tongue. The nests are collected by means of ladders, and often by means of ropes, which enable the gatherers to descend from the summit of a precipice, like the rock-fowlers of the north. The gathering of the nests takes place after the young are fledged, thrice in a year. In the Chinese market the nests are sold for from £2 to £7 per lb., according to the quality, and they are, of course, used only by the most wealthy, chiefly for thickening rich soups. The imports at Canton are reckoned at 1200 piculs, or 168,000 lbs., representing about 8,400,000 nests. The nests are very wholesome and nourishing, but quite devoid of the peculiar properties which the Chinese ascribe to them. Five caverns at Karang, Bollong, in Java, contain 330,000 swallows, and yield annually about 500,000 nests. The Dutch export them to China. The nests weigh about half an ounce each.

NETH'ERLANDS, The Kingdom of, lies between 50° 43′ and 53° 36′ n. lat., and 3° 22′ and 7° 16′ e. long., is bounded on the n. by the North sea, e. by Hanover and the western part of Prussia, s. by Liége, Belgian Limburg, Antwerp, east and west Flanders, w. by the North sea. Its greatest length from n. to s. is 195 English m., and its greatest breadth from the w., on the North sea, to the extremity of Overyssel, on the e., 110 English miles. It contains 12,597 sq. miles. Pop., including the grand duchy of Luxemburg, 3,835,111. The following table gives the population, Jan. 1, 1872, the area of the provinces, including the reclaimed Haarlem lake, and the provincial capitals:

Provinces.	Area in Sq. Miles.	Pop. 1872.	Provincial Capitals.
North Brabant	1,960	435,262	's Hertogenbosch.
Gelderland	1,948	436,029	Arnhem.
South Holland	1,162	700,499	The Hague.
North Holland	1,050	591,338	Haarlem.
Zeeland	665	181,582	Middelburg.
Utrecht	582	175,087	Utrecht.
Friesland	1,258	300,257	Leeuwarden.
Overyssel	1,274	256,681	Zwolle.
Groningen	896	228,883	Groningen.
Drenthe	1,017	106,713	Assen.
Limburg	840	225,852	Maastricht.
	12,597	3,637,583	
Grand Duchy of Luxemburg	987	197,528	Luxemburg.
Total	13,584	3,835,111	

The pop. (Jan. 1, 1875) had, exclusive of Luxemburg, increased to 3,715,676, averaging 295 to the sq. mile. In Drenthe it is 105, and in South and North Holland rises to 632 and 591; Utrecht, Limburg, and Zeeland being the next densely peopled. In 1871 the births amounted to 128,305, of which 4,599 were illegitimate. The average was 1 to 27.90. In North Brabant, 1 to 44.38; Gelderland, 1 to 30.04; South Holland, 1 to 22.73; North Holland, 1 to 24.23; Zeeland, 1 to 26.30; Utrecht, 1 to 21.43; Friesland, 1 to 36.24; Overyssel, 1 to 45.07; Groningen, 1 to 22.54; Drenthe, 1 to 32.03; Limburg, 1 to 37.44.

The leading places are Amsterdam, Rotterdam, Dordrecht, Alkmaar, Middelburg, Schiedam, Leyden, Delft, Gouda, Utrecht, Amersfort, Groningen, Meppel, Zwolle, Kampen, Deventer, Arnhem, Nymegen, Tiel, Gorinchem, 's Hertogenbosch, Tilburg, and Breda.

Physical Aspect.—The land is generally low, much of it being under the level of the sea, rivers, and canals, especially in North and South Holland, Zeeland, the southern part of Gelderland, and Friesland. Along the west coast, the low lands are protected from the sea by a line of sand-hills or dunes; and where that natural defense is wanting, strong dikes have been constructed, and are maintained at great expense, to keep back the waters. The greatest of these dikes are those of the Helder and of West Kapelle. on the east coast of Walcheren (q.v.), which require, each, upward of £6,000 annually to keep them in order. Engineers, called the officers of the Waterstaat, take special charge of the dikes and national hydraulic works, the expense of which is reckoned at about half a million sterling. A hilly district stretches from Prussia through Drenthe. Overyssel, the Veluwe or Arnhem district of Gelderland, the eastern part of Utrecht. into the Betuwe or country between the Maas and the Waal. This tract of country has many pretty spots, is of a light, sandy soil, well watered, and, when not cultivated, is covered with heath or oak-coppice. The greatest part of the Netherlands is very fertile, the low lands and drained lakes, called polders (q.v.), being adapted for pasturing cattle. and the light soils for cereals and fruits; but in some districts there are sandy heath-clad plains, extensive peat-lands, and undrained morasses, which industry is rapidly bringing under cultivation.

Islands, Rivers, Canals, Etc.—The islands may be divided into two groups, of which the southern, formed by the mouths of the Schelde and Maas, contains Walcheren, South and North Beveland, Schouwen, Duiveland, Tholen, St. Philipsland, Goeree, Voorne, Putten, Beyerland, Ysselmonde, Rozenburg, and the island of Dordrecht. The northern group contains the islands at the entrance of the Zuyder Zee and along the coasts of Groningen and Friesland, as Wieringen, Texel, Vlieland, Terschelling, Ameland, Schiermonnikoog, and Rottum. In the Zuyder Zee are Marken, Urk, and Schokland.

The chief rivers are the Rhine, Maas, and Schelde. Important branches of these are the Waal, Lek, Yssel, Roer, etc.

Water-ways are more numerous than in any other European country, the immense tracts of meadow-land and the fertile polders being girdled by large canals, and cut in all directions by smaller ones for drainage and communication. Those of most importance to the national trade are, the North Holland canal, constructed 1819 to 1825, to connect the port of Amsterdam with the North sea; the Voorne canal, from the n. side of Voorne to Hellevoetsluis, which shortens the outlet from Rotterdam; the South Willemsvaart, through North Brabant, Dutch and Belgian Limburg, from 's Hertogenbosch to Maastricht, being 71¼ English m. in length, and having 24 locks. Besides these, there are numerous important canals, connecting rivers, and cutting the kingdom into a network of water-courses. To improve the entrance to the Maas, the Hoek of Holland has lately been cut. A new canal throuth the Y and peninsula of Holland was opened Nov. 1, 1876. It is nowhere less than 80 yards broad, with sluices nearly 400 ft. in length, and a depth of nearly 23 feet. This has reduced the distance from Amsterdam to the sea to about 16 m., and provides a safe way for large ships. The harbor, in 52° 29′ n. lat. and 4° 36′ e. long., is formed by piers of concrete built into the North sea. The expense, including the recovery of 15.000 acres of land from the Y amounted to about two millions sterling.

Railways have been constructed to the extent of about 1008 m., forming lines of communication between the principal cities of the Netherlands, and with Prussia to the s.e., and Belgian to the s. west. The receipts of the three main lines in 1872 amounted to £696,585. These belong to companies. The state railways realized £445,966, and carried 3,188,443 passengers. The two oldest companies gave dividends of 6½ and 8¾ per cent.

Climate, Agriculture, Produce, etc.—The climate of the n. is variable, chilly colds often closely succeeding high temperatures, inducing various forms of fever and ague, and requiring peculiar care as to clothing, etc. In summer the thermometer sometimes rises above 80°, and even to 90° F. in the shade, and a winter of great severity usually occurs every fifth year, when carriages and heavily-laden wagons cross the rivers and the Y on the ice, and thousands enjoy the national pastime of skating.

The farms are generally small and well cultivated, though the implements are old-fashioned and clumsy. Much progress is being made in reclaiming the sandy wastes, in Drenthe and Overyssel, by planting them with fir and oak, and sowing buckwheat, oats, and rye. The best implements are also being gradually introduced from England, and the steam-plow was, in 1862, put in operation on the lands of the drained Haarlem lake.

The following table shows the agricultural products, with their values, for 1872, according to government returns:

Wheat to the value of	£2,848,500
Rye	4,422,750
Barley	1,092,833
Oats	2,217,500
Beans	650,250
Peas	436,416
Buckwheat	815,583
Colza	675,666
Potatoes	4,309,916
Madder	277,583
Chicory	69,666
Flax	903,000
Hemp	45,833
Beet	898,666
Tobacco	169,163
Various	21,849
Total	£19,340,164

In 1874 the total value of agricultural products was about £17,500,000. In 1872 wheat occupied 211,960 acres; rye, 493,639 acres; barley, 111,811 acres; oats, 246,651 acres; potatoes, 312,329 acres; flax, 46,846 acres.

In 1872 the Netherlands possessed 247,900 horses, 1,877,000 head of cattle, 855,300 sheep, 139,500 goats, and 320,100 pigs. The leading agricultural products of Zealand are wheat and madder; in South Holland, madder, hemp, butter, and cheese: in North Holland, butter and cheese are extensively made, and cattle, sheep, and pigs reared and exported. The horses of Friesland, Zeeland, and Gelderland are of first-rate quality. The exportation of butter from Holland and Friesland, and of Edam, Leyden, Gouda, and Frisian cheese, is large; in 1873 the value of the exports of cheese was £1,013,283, of butter £1,458,875. Fruit is abundant, and in several provinces, as Gelderland, Utrecht, and Drenthe, much attention is paid to bees. In Haarlem and neighborhood, tulips and hyacinths are much cultivated, realizing a large annual amount. In 1874 the foreign trade in bulbs reached, in the district, £37,500. The inland sales realized £47,833. Wild ducks, snipes, plovers, and hares are plentiful; and there are also conies, partridges, pheasants, and deer—game forming an article of export.

Geology, Mineralogy, etc.—The Netherlands are of recent formation, and consist of an alluvial deposit, chiefly of a deep, rich clayey soil, superimposed on banks of sand, marine shells, and beds of peat and clay. It appears that at some distant period there had been a depression of the land below its former level, enabling the sea to burst through its sand-banks, submerge the land, and form new deposits. The higher districts are composed of sand-drift mingled with fertile earths, and resting on a bed of clay. Coal is worked in Limburg; and a soft sandstone, which becomes fit for building purposes after having been some time exposed to the atmosphere, is quarried in the southern part of that province, which has also pipe and other clays. Valuable clays for pottery, tile, and brick making, abound in the various provices.

Manufactures, Industries, etc.—The chief manufactures are linen, woolen, cotton, and silk fabrics; paper, leather, glass, etc. Leyden and Tilburg are famed for woolen blankets, wool-dyed pilot, fine cloths, and friezes; 's Hertogenbosch for linens and rich damasks; calicoes, shirtings, drills, table-cloths, striped dimities are made at Almelo, Amersfort, and in the leading towns of Overyssel. Good imitation Smyrna and Scotch carpets, and carpets of hair and wool, are manufactured at Deventer, Delft, Arnhem, Hilversum, Utrecht, and Breda; Turkey-red yarns, dyed silks, and silk stuffs at Roermond, Utrecht, Haarlem, etc.; leather, glass, firearms, at Maastricht and Delft; iron-founding, rolling and hammering of lead and copper, cannon-founding are carried on at the Hague, etc.; and powder-mills at Muiden; Oudenkerk, Middelburg, 's Hertogenbosch, Amsterdam, Nymegen, etc., have important breweries, those of 's Hertogenbosch and Amsterdam manufacturing very large quantities. Waalwyk, Heusden, and surrounding districts, manufacture boots and shoes, of which Heusden sends to North and South Holland 1,000,000 pairs yearly. Gin is distilled at Schiedam, Delft, Rotterdam, and Weesp. Amsterdam has the largest diamond-cutting trade in the world, 10,000 persons depending on that branch of industry. Sugar-refining is largely carried on at Amsterdam, Rotterdam, and Dordrecht, from all of which sugar is exported to Russia, the Levant, and countries of Europe. Paper is chiefly made in Holland and Gelderland. The leading letter-type founders are at Amsterdam and Haarlem. Manufactures of every kind are being rapidly increased in number, and adding to the material prosperity of the Netherlands. The chief motive power is the windmill, which forms a never-failing element in the scenery; but of late years steam is becoming more general. In 1854 the steam-engines employed in factories were 464, with 7,980 horse-power; and in 1872 they amounted to 1822, of 21,408 horse-power, and the increase has since been going on.

Many people are employed in the immense inland shipping-trade which the canal network has fostered, there being, when the previous census was taken, 6,684 ships inhabited by families, or one inhabited ship to 81 houses. The houses were 542,295; families, 668,911. Fishing, not only in the inland waters, the coasts, and bays of the North sea, but also on the coast of Scotland, is vigorously pursued. In 1873 the total value of the herrings taken in the North sea was £127,660, 102 vessels having been employed; on the Netherlands coasts, to the value of £77,734; and in the Zuyder Zee and coasts were taken 87,331,950 herrings. The anchovy take, almost exclusively in the Zuyder Zee, amounted to 30,000 ankers, valued at about £58,750. There are productive oyster beds, besides extensive fishings of cod, ling, turbot, flounders, soles, shrimps, haddock, etc.; and from the rivers, salmon, eels, perch, etc.

Exports, Imports, Shipping, etc.—The Netherlands is peculiarly a mercantile as well as agricultural country; its merchants not only importing and exporting the products of their colonies and the surplus of their own country, but also those of other lands. The general imports (1875) were 6,520,217 tons; exports, 3,200,944 tons. The value of goods imported for use was £59,820,520, and of exports, £44,914,242, home produce; both were less in 1876. The leading exports are cheese, butter, refined sugar, flax, cattle, sheep, pigs, gin, garancine, etc.; the imports, manufactured goods, unrefined sugar, coffee, grain, iron, yarns, cotton, rice, gold, silver, tin, tea, indigo, silk, and woolen fabrics. The trade with Great Britain is large and varied, and carried on chiefly by steam-vessels.

In 1877, 8,166 vessels (of which 2,488 were Dutch), with a burden of 8,119,327 tons, entered Dutch ports; and 4,936 (of which 2,638 were Dutch), of 4,852,850 tons, cleared. The mercantile marine of the Netherlands in 1878 comprised 1247 sea-going vessels (79 being steamers), with a tonnage of 958,652. The trade along the rivers, by Belgian and German ships, is large. In 1873 the goods passing up the Rhine amounted to 844,191 tons, and from Germany down, 1,538,080. This trade consists largely of grain, timber, and coal. Wheat carried up, 110,263 tons, and rye, 116,774 tons; down, 4,854 tons of wheat, and 10,355 of potatoes. Timber, upwards, 86,042 tons; downwards, 56,087 tons. Coal, 1,026,119; and iron, 31,119 tons.

Religion, Language, Education, etc.—At the last census (1879) there were 2,193,281 Protestants, 1,313,052 Roman Catholics, 68,003 Jews, and 5,193 to small sects. There were (Jan. 1, 1875) 2,034 Protestant ministers, of whom 1598 were Dutch Reformed; 2,062 Roman Catholic priests; and 168 Jewish congregations. The official estimate of the population at the beginning of 1878 gave the total at 3,924,792.

There are five dialects spoken respectively in Groningen, Friesland, Gelderland, Holland, and Zealand. These differ considerably from each other, and the Frisian is not at all understood by natives of the other provinces. The written language is the Dutch, that branch of the great Teutonic stock which preserves more of its original character than the rest of the same family. It possesses numerous words the same as Lowland Scotch, and bears a strong affinity to the old Saxon English, as the following Dutch proverb shows:

> **Als de wyn is in den man,**
> **Is de wysheid in de kan.**

The kingdom of the Netherlands has produced many great names in all branches of literature and science. Coster (q.v.), according to his countrymen, invented printing, Leeuwenhoek the microscope, and Huygens applied the pendulum. Out of a long list of distinguished names, may be mentioned those of Erasmus, Scaliger, Heinsius, Hugo de Groot (Grotius), Huygens, Leeuwenhoek, Vitringa, Boerhave, and the poets Hooft, Vondel, and Cats; whilst the writings of Van der Palm, Van Lennep, Des Amoire van der Hoeven, Haafner, Stuart, Van Kampen, and those of the poets Bilderdyk, Da Costa, De Bull, Van den Berg, ter Haar, and Hofdyk, show that literature is not waning. Exclusive of newspapers, there are 226 magazines and periodicals published in the Netherlands, of which 67 are religious, 42 on art, belles-lettres, and general literatnre, and 7 on antiquity, history, etc. Leading painters of the old Dutch school were Rembrandt, Gerrit (Gerard) Dou, Gabriel Metzu, Jan Steen, Paul Potter, Ruysdaal, Van der Helst;

and among those of the present century, Ary Schaffer, Koekoek, Schelfhout, Pieneman, Kruseman, Van Os, Craeyvanger, Ten Kate, Israels, Bles, Louis Meyer, Roeloff, Springer, etc., have distinguished themselves.

There are universities at Leyden, Utrecht, and Groningen; *athenæums* or colleges at Amsterdam, Deventer and Maastricht, the students attending which must be examined for degrees at one of the universities. Latin schools are in all the leading towns. The universities and athenæums have faculties of theology, medicine, philosophy, law, and letters. There are also the royal military and naval academy at Breda, and that for engineers and the India civil service at Delft; seminaries in several places for the training of the Roman Catholic clergy; and others, especially in Amsterdam, for those of the smaller Protestant sects; and many literary, scientific, and agricultural institutes.

Each community or parish must have, at least, one elementary school, supported from the local public funds, in which reading, writing, arithmetic, history, geography, etc., are taught. A higher class of schools includes also foreign languages. All are under government inspectors, and the teachers must undergo stringent examinations on all the branches before obtaining permission to teach. Many society or subscription schools are being erected all over the land, with a normal school at Nymegen, not under government surveillance, and including religious instruction, which is excluded from the national public schools. The members of these societies pay a yearly subscription and a small fee for each pupil sent by them to the school, a select number acting as managers. There are national normal schools at 's Hertogenbosch, Haarlem, and Groningen, the pupil-teachers boarding themselves, and receiving, at 's Hertogenbosch, £21 a year, and at Haarlem £24. The attendance at school is about 1 to 8 of the population in winter, and 1 to 10 in summer. In Jan. 1872, 258,489 boys and 225,779 girls; in July, 237,685 boys and 218,729 girls were at public and private elementary schools, with 8,838 male and 2,251 female teachers.

Army, Navy, etc.—The strength of the army, in Europe (1878) was 2,060 officers and 60,850 men; of the Indian army, 1480 officers and 37,800 men. It is composed of volunteers, and of one man for every 500, drawn by lot for five years' service. There is also a local force, called the schuttery, drawn by lot from those between 25 and 34 years of age, to assist in keeping order and peace, and in case of war, to act as a mobile corps, and do garrison duty. If attacked on the land-side, 90,000 men are required for the defenses, and if by land and sea, 106,000. The first, or Maas line of defense, is formed by Maastricht, Venlo, Grave, 's Hertogenbosch, Woudrichem, Geertruidenberg, Willemstad, Breda, and Bergen-op-Zoom. The second line is formed by Nymegen, Forts St Andries and Loevestein and Gorinchem. The inner line of Utrecht is formed by various forts from Faarden, Utrecht to Gorinchem, which, by inundations, can make the provinces of North and South Holland into an island. There are many other forts, batteries and strengths at the mouths of the rivers and along the leading ways, and a new line of defence was agreed upon in 1874.

The royal navy consisted (July 1, 1878) of 99 steamers carrying 400 guns, and 16 sailing vessels with 103. The sailors and marines numbered 8,470 officers and men, including 701 native East Indians. A large double-turret ship, with four 35-ton Armstrong guns, was added in 1876 to the iron-clads. Prince Frederic, uncle of the king, is admiral; the prince of Orange, vice-admiral; and his majesty is commander-in-chief of the land and naval forces.

Revenue, Expenditure, etc.—The revenue of 1878 was estimated at £8,539,530, and the expenditure at £9,849,941, the difference to be met from accumulated surpluses and the regular increase. The principal receipts are from direct taxes, excise, indirect taxes, import and export dues. Among items of expenditure are £883,300 for public works, chiefly railways; £2,250,000 for interest on the national debt; and £333,800 to improve the defenses. The India revenue for 1878 was estimated at £12,000,478; the expenditure equals the revenue. The East India colonies, which were a burden in the earlier years of the kingdom, have long been a source of profit.

From 1850 to and with 1874, there has been paid off £25,376,218 from the national debt, lessening the annual interest by the sum of £784,709. The interest payable on the debt amounted in 1879 to £2,225,000. The material prosperity of the Netherlands is rapidly increasing, and a sum of probably not less than £800,000,000 is invested by Netherlands capitalists in the funds of other nations.

The chief colonies are Java, Sumatra, Borneo, Celebes, the Spice Islands, and Papua or New Guinea, in the East; and Surinam, Curaçao, and its dependencies, in the West Indies, with factories on the coast of Guinea. Colonial pop. estimated at 24,386,991.

Government, Franchise, etc.—The government of the Netherlands is a limited constitutional monarchy, hereditary in the male line, and by default of that in the female. The crown-prince bears the title of prince of Orange, and attains his majority at eighteen, when he takes his seat in the council of state. The executive is vested in the king, with a council of state composed of twelve members, nominated by his majesty, and the ministers of the interior, foreign affairs, finance, war, the colonies, marine, and justice, the last named taking charge of ecclesiastical affairs through two administrators, or under-secretaries of state, for the Protestant and Roman Catholic churches. The legislative power is shared by the king and the two chambers of the states-general; the first chamber having 39 members, elected for nine years, by the provincial states, one-third of their number retiring every three years. The second chamber has 80 members chosen by electors numbering, in 1874, 108,813, above 23 years of age, who pay from £1, 14s. to £13, 12s. of direct taxes, according to the size and importance of the electoral district. These are elected for four years, one-half of the chamber retiring every two years. For members of the town-councils, the electoral qualification is half the above sums. The members of both chambers must be 30 years of age before the day of election, and those eligible for the first chamber are the nobility. This exceedingly high franchise, which, in Amsterdam, is a higher direct tax than the rental qualification of Great Britain, makes an election a thing of no interest except to a few. In 1871, only 36.2 per cent. of the electors of North Holland gave their votes, and the maximum in any place was 66.9 per cent in Limburg, 62.5 in North Brabant, the average being 48.6.

The king nominates the governors of provinces, the burgemeesters of every city, town, or village, and a host of other officials. The cities, towns, and rural parishes are governed by a council, burgemeester (mayor or provost), and wethouders (aldermen or bailies). The council consists of from 7 to 39 members, according to the population, who are chosen for six years, one-third part retiring every two years. The council selects out of their number from 2 to 4 wethouders for six years, one-half retiring every third year. These with the burgemeester form the local executive. The law departments are the high council, the provincial courts of justice, those of the arrondissements and cantons; appeal in many cases being open from the lower to the higher courts.

History.—Nothing is known regarding the original inhabitants of the Netherlands; but about a century and a half before our era the people known as the Batavi came out of Hesse, where they were living in hostility with their neighbors, and settled down between the Rhine and the Waal. At this time the Frisians occupied the country n. of the Rhine to the Elbe. The Batavi and Frisians differed little in appearance, manner of life, and religion. They clothed themselves with skins, lived by fishing, hunting, and pasturing cattle, possessing horses, cows, and sheep; were faithful, open-hearted, chaste, and hospitable. The songs of the bards composed their literature and history. Warlike and brave, they selected their leader for his courage and prowess, were armed with the bow and a short spear. They worshiped the sun and moon, and held their meetings in consecrated woods.

The Romans having subdued the Belgæ, next attacked the Frisians, who agreed to pay a tribute of ox-hides and horns, but continued restless and rebellious. The Batavi became allies of Rome, paying no tribute, but supplying a volunteer contingent, chiefly of cavalry, which decided the battle of Pharsalia in favor of Cæsar, and formed a gallant band of the Roman armies in all parts of the empire. About 70 A.D. Claudius Civilis, a Batavian, whose original name has not been preserved, made a bold effort to overthrow the Roman power in Rhenish or Germanic Gaul, but he was finally compelled to sue for peace. Towards the close of the 3d c. began the inroads of the Franks, followed by the Saxons and other races; and in the 5th c. the Batavi had ceased to exist as a distinct people. The Franks continued to spread, and with them the Christian religion. Dagobert I., one of their princes, erecting a church at Utrecht, which, 695, became the seat of a bishopric. The Frisians were opposed to and the last to embrace Christianity, to which they were forcibly converted by Charles Martel. At the end of the 8th c. all the Low Countries submitted to Charlemagne, who built a palace at Nymegen, on the Waal. The feudal system now began to develop itself and expand into dukedoms, counties, lordships, and bishoprics, which the dukes, counts, and bishops, especially the counts of Holland and bishops of Utrecht, endeavored to enlarge and to rule over with as little submission to their superior as possible. The crusades weakened the power and drained the resources of the nobles and priesthood, so that, during the middle ages, cities began to assume importance, strengthen themselves with walls, choose their own rulers, and appear in the state meetings. In 1384 the county of Flanders passed, through marriage, to the duke of Burgundy, whose grandson, Philip the good, made it his special life-effort to form the Netherlands into a powerful kingdom. He bought Namur, inherited Brabant with Limburg, and compelled Jacoba of Bavaria to resign Holland and Zealand. Charles V., as heir of the house of Burgundy, inherited and united the Netherlands under his scepter, and the country attained to prosperity through the encouragements which he gave to commerce and shipping. Philip II., who succeeded his father, 1555, by his harsh government and persecution of the reformers excited the Netherlands to rebellion, which after a struggle of 80 years resulted in the firm establishment of the republic of the United Provinces. The founder of the independence of the Netherlands was William of Nassau, prince of Orange, called in history the silent, who freely sacrificed his own property, and put forth every effort to unite the discordant states of the south with those of the north in resisting the Spanish yoke. Retiring to Holland, and banding together several provinces for mutual defense, by an agreement made at Utrecht, 1579, he perseveringly opposed the efforts of Spain; and in 1609 the independency of the United Provinces (the boundaries of which nearly coincided with those of the present kingdom of the Netherlands) was virtually acknowledged by the Spanish king, an armistice for twelve years being signed at Antwerp, April 9 of that year. The struggle was renewed and carried on till 1648, when all the powers acknowledged the independence of the United Provinces by the treaty of Munster, while the Belgic provinces, divided among themselves, remained submissive to Spain and to the Roman Catholic church.

Prince William the silent did not live to see his efforts for freedom crowned with success. Excited by religious fanaticism, and the hope of a great reward, Balthazar Gerard, or Guion, 1584, shot the prince in his house at Delft, from a narrow passage, as he was stepping from the dining-room to ascend an adjoining stair which led to the second floor. With the 17th c. the United Provinces began to advance in power and wealth, their ships visiting all parts of the world. Meanwhile the contest between the Arminians and Calvinists broke out, and raged with fury for many years; Grotius and others fleeing to other lands, and the statesman Oldenbarneveld suffering on the scaffold at the age of 72. The United Provinces were presided over by the princes of Orange till the troubles at the end of the 18th c. began the long European war, which the battle of Waterloo brought to a close. The national convention of France having declared war against Great Britain and the stadtholder of Holland, 1793, French armies overran Belgium, 1794; and being welcomed by the so-called patriots of the United Provinces, William V. and his family, Jan., 1795, were obliged to escape from Scheveningen to England in a fishing-junk, and the French rule began. The United Provinces now became the Batavian republic, paying eight and a half millions sterling for a French army of 25,000 men, besides giving up important parts of the country along the Belgian frontier. After several changes, Louis Bonaparte, June 5, 1806, was appointed king of Holland, but four years later was obliged to resign because he refused to be a mere tool in the hands of the French emperor. Holland was then added to the empire, and formed seven departments. The fall of Napoleon I., and dismemberment of the French empire, led to the recall of the Orange family, and the formation of the southern and northern provinces into the ill-assorted kingdom of the Netherlands, which in 1830 was broken up by the secession of Belgium. In 1839 peace was finally concluded with Belgium; but almost immediately after national discontent with the government showed itself, and William I., in 1840, abdicated in favor of his son. The Netherlands being moved by the revolutionary fever of 1848, king William II. granted a new constitution, according to which new chambers were chosen, but had scarcely met when he died, March, 1849, and the present king, William III., ascended the throne. The nation is prosperous, and on May 11, 1874, the twenty-fifth anniversary of the present king's reign was celebrated with great rejoicings.

A bill for the emancipation of the slaves in the Netherlands West India possessions passed both chambers Aug. 8, 1862, and received the royal assent. It decreed a compensation of 300 guilders for each slave, except those of the island of St. Martin, who were to be compensated for at 30 guilders each. The freed negroes may choose the place to labor, but must be able to satisfy the government officers that they are employed somewhere. This surveillance to continue during ten years. The law came into force July 1, 1863, and in Surinam and all the other colonies the day passed quietly over. Those, however, interested in agriculture have sent an address to the minister of the colonies, protesting against the high-wages tariff as hostile to the successful carrying on of their operations. The rate, however, is not higher than the planters in the neighboring British colony of British Guiana are accustomed to pay. In the budget for 1863 provision was made for the extraordinary expenses connected with the emancipation to the amount of £1,065,366, of which £867,000 as compensation for the slaves of Surinam, and £21,250 as premiums for free labor. For Curaçoa and its dependencies, £166,090 of compensation money, fully £12,000 being for various other outlays connected with the change. The number of slaves set free may be stated in round numbers to be 42,000, of whom 35,000 are in Dutch Guiana.

On July 16, 1863, a treaty was signed at Brussels by all the naval powers for the buying up of the toll levied, under treaty arrangements, by the king of the Netherlands, on vessels navigating the Schelde (q.v.), the king of Belgium binding himself also to reduce the harbor, pilot, and other charges on shipping within that kingdom.

The Netherlands have suffered much from floods, either caused by the breaking in of the sea, or by the descent of masses of water from Germany, while the rivers of the Rhine delta were blocked up with ice. The Zuyder Zee (q.v.), which contains 1365 sq.m., was of trifling extent till the flood of All Saints' day, 1247, when the North sea swallowed up a large tract of country. In 1277 the Dollart gulf, in Groningen, was formed at the mouth of the Ems, by floods in the spring and autumn of that year, which destroyed 33 villages and 100,000 people. The immense waste of waters known as the sunken South Holland Waarde, or Biesbosch, arose out of the breaking of one of the dykes, 1421, by which 72 villages were laid under water, only 34 of them reappearing. In modern times great floods, but fortunately with only temporary results, have occurred in 1809, 1825, and 1855. That of 1855, which placed the town of Veenendaal, in Gelderland, and an extensive tract of country under water, was caused by a rapid thaw in the high lands of Germany pouring down torrents of water into the Netherlands while the rivers were ice-locked after a winter of unusual severity.—See the *Allgemeene Statistiek van Nederland; Nederland-Geographisch-Historisch Overzigt*, by Luit. L. G. Beausar; *Statistiek Jaarboek* (Witkamp, Amsterdam), an excellent book of reference, which is published yearly up to the present time; the provincial annual reports, etc.

NETHERLANDS (*ante*). See DUTCH LANGUAGE AND LITERATURE.

NETHERLANDS TRADING COMPANY, a chartered joint-stock association, with limited liability, formed to aid in developing the natural resources of the Dutch East Indian possessions. The company possesses peculiar privileges, acting exclusively as the commission-agents of the Netherlands government in importing and selling the produce of the colonies, as well as doing a large business as merchants. Private enterprise having failed to develop the trade of Java, after that island was restored to the Netherlands, King William I., in 1824, erected the trading company, with a capital of upwards of 3 millions sterling, not only becoming a large shareholder, but guaranteeing an interest of 1 per cent on the paid-up capital. The early transactions were unprofitable, and in 1827 the king had to pay a part, and in 1830 the whole of the guaranteed interest. From that date, it has prospered and handed over, from the trade of Java (q.v.), large surplus balances into the national revenue. The head office of the directors is at Amsterdam, with agents at Rotterdam, Middleburg, Dordrecht, and Schiedam; the principal factory at Batavia, with agencies at the chief ports in Java and the other Netherlands possessions in the Eastern Archipelago. Formerly the company sent large quantities of goods to the colonial markets for the account of the Dutch government; but since the beginning of 1875, the business for the government has been confined to colonial produce, which is placed in factories, forwarded to Holland, and disposed of at the company's sales in Amsterdam, Rotterdam, etc. In 1875, they sold for the government 756,959 bales of coffee, which realized £4,378,292; 136,768 blocks of banca and 2,956 of Billiton tin, at £376,548; 432 packages of cinchona bark and powder at £5,977. On the company's account, colonial produce was sold to the value of £761,267; and calicoes, yarns, woolen stuffs, various goods, precious stones, and money to the value of £214,688, were sent to Netherlands-India, Singapore, British India, China, Japan, and Surinam. The company also advance money to planters and manufacturers in the colonies, who bind themselves for a number of years to consign their produce. They are also owners of a large sugar plantation, Resolutie, in Surinam. The present capital is 36,140,000 guilders, or £3,011,666. The commission paid by government is a chief source of profit. For 1875, the net gain was £180,354, from which the shareholders received 5¼ per cent. The result would have been more favorable had not heavy loss been sustained in the Japan trade.

The success of the trading company depends mainly on the culture system, which was introduced into Java in 1830. Under the native rule, the land belonged to the princes, and the cultivators paid one-fifth of the produce, and one-fifth of their labor as ground-rent. The Dutch, by conquest, are now the proprietors of the greater part of the island, and exact the old produce rent, relaxing the labor to one-seventh, and causing the holders of crown-lands to plant one-fifth of their cultivated fields with the crop best adapted for the soil and required for the European market. The government also has supplied, free of interest, enterprising young men with the capital necessary to erect and carry on works for the preparation of the raw materials, to be repaid in ten yearly instalments, beginning with the third year. The land-holders of a certain district allotted to a sugar-mill were bound to supply a fixed quantity, receiving advances upon the crop to enable them to bring it forward. The rule of fixed quantity was relaxed in 1860, and has caused great discontentment among the contractors. The European residents and their assistants, the native princes, chiefs, and village head-men, receive a percentage according to the quantity which is manufactured from the produce delivered, so that all are interested in taking care that the lands are cultivated and the crops cared for. Sugar, tobacco, and tea are prepared by contractors; indigo, cochineal, coffee, cinnamon and pepper, by the natives under European surveillance, all passing into the trading company's factories for shipment to the Netherlands. The objections to the system are, that it does not leave the labor of the natives free, and that the passing of so much of the export and import trade through one favored company injures the general merchant. On the other hand, it must be said that the Dutch government only carries out the old law, and it is therefore not regarded by the peasantry as an infringement of their rights; and the merchants and capitalists of the Netherlands did not of themselves put forth sufficient efforts to work out the natural capabilities of Java when it returned under Dutch rule.

NETLEY, ROYAL VICTORIA HOSPITAL AT, is a superb building, on the shore of Southampton water, for the reception of invalids from the army on foreign service, and from among the troops serving in the adjoining military districts. In times of peace, it is only necessary to use a portion of the vast structure; but in the event of a European war, in which the British army should take part, the exigencies of the service would probably tax its accommodation to the utmost. There is provision for 1,000 patients, with power to increase the number if necessary. The medical staff of course varies in proportion to the work to be done; but at present it consists of a governor, an adjutant, a pay-master, an assistant-commandant, and medical officers, and officers of orderlies of various ranks. The total cost of the construction of this hospital, which was commenced in 1855, has been about £350,000. Attached is the medical school for candidates for the army medical department, the students having the best means of practical instruction in the wards of the hospital. Netley is also the headquarters of the female nurses of the army, who are under the control of a lady stationed here as superintendent. Complete arrangements have been made for the landing of wounded men in front of the hospital, and for conveying them thither with the least disturbance. There is no doubt as to the convenience of this great hospital for its purposes; but some questions have been raised, under high sanitary authority, as to the salubrity of the site, adjacent as it is to the wide banks of mud which Southampton water uncovers at low tide.

NETS are fabrics in which the threads cross each other at right angles, leaving a comparatively large open space between them; threads are also knotted at the intersections. In this respect netting differs essentially from weaving, where the intersecting threads simply cross each other. The open spaces in nets are called *meshes*, and these correspond in size with an instrument used in net-making, consisting of a flat piece of wood or other hard substance, usually about the shape and size of a common paper-knife. In addition to this, a peculiar kind of needle is used, upon which a large quantity of the thread is placed by winding it from end to end between the forked extremities; the holes are used to insert the end of the thread, to prevent it slipping off at the commencement of the winding. The art of net-making has been practiced from the earliest times by the most savage as well as the most civilized nations. Even where the art of weaving was quite unknown, as in some of the South Sea islands when first discovered, that of netting was well understood; and it is easy to see that the human race could not help learning the value of this art from seeing how frequently land and water animals get entangled in the shrubs and weeds through which they attempt to pass; hence we find amongst savage tribes, almost universally, nets are used not only for fishing, as with us, but also for entrapping land animals. We have ample illustrations of the uses of nets for both purposes in the bas-reliefs of Assyria, Greece, and Rome, and in the mural paintings of Egypt.

Until recently nets have been always made by hand, and generally the thread has been a more or less thick twine of hemp or flax, the thickness of the twine and the size of the mesh depending upon the kind of fish for which it was made; recently, however, great improvements have been made in the manufacture of nets, and machinery of a most beautiful automatic kind has been introduced by Messrs. Stuart of Musselburg, whose manufactory is of vast extent. This establishment commences with the raw materials, which are hemp, flax, and cotton, the last having been extensively employed for herring and sprat nets of late years. Hemp, however, is the chief material for net-making; and in order to prepare it, it is first passed in long rolls through a machine consisting of two rollers with blunt ridges, the upper of which is kept down on the material by means of a hanging weight, consisting of a loaded box suspended to a chain from the axle of the roller. After the fiber has passed through this, it is much more supple than before, and is then *hackled;* this process is also done by machinery, which was first introduced into this manufactory for hemp-hackling, and succeeds admirably. It subsequently passes through the carding, roving, and spinning processes, as in all other kinds of yarn, and is finally twisted into threads or twines of the required thickness. Messrs. Stuart have in one room 4,000 spindles at work, besides the carding and twist machines. Of their patent loom they have 200 at work, the largest of which makes nets 480 meshes in width. It would be useless to attempt to describe these ingenious looms, which are worked by hand, otherwise than by saying that their leading features are like the stocking-frames; a series of sinkers push forward, pull down, and pass in and out the thread, which is carried from one side of the web to the other by long iron needles, which act as shuttles passing not over-quickly from a long box on each side of the loom. The bobbins of twine which feeds the needle must have a conical form, which is most ingeniously given it by a special contrivance, in the twisting-machine; twine passes through small rings to prevent it being given off too quickly, or in knots or kinks. This simple yet most effective contrivances is worked by wheels and jointed rods, and might be advantageously applied to many other purposes. After the net comes from the loom, it goes to the finishers, who, by hand, make the addition of a kind of selvage, consisting of several thicknesses of twine, to give strength to the edges. The nets are then ready for use, and are sent in vast numbers to all parts of the world. Machine net-making is now becoming general.

A great variety of nets are in use amongst fishermen, but the principal are the *seine*, *trawl*, and *drift nets*. The seine is a very long but not very wide net, one side of which is loaded with pieces of lead, and consequently sinks; the other, or upper, is buoyed with pieces of cork, and consequently is kept up to the surface. Seines are sometimes as much as 190 fathoms in length. When stretched out they constitute walls of net-work in the water, and are made to inclose vast shoals of fish. The trawl is dragged along the bottom by the fishing-boat; and the drift-net is like the seine, but is not loaded with lead; it is usually employed for mackerel fishing.

Various kinds of nets are used in bird-catching, one of which is noticed in the article CLAP-NET. Nets are used in catching quadrupeds, chiefly for the purpose of inclosing spaces within which they are, but sometimes also for throwing upon them to confuse and entangle them.

Nets are used by gardeners to protect crops from birds; also to protect the blossoms of trees from frost, and it is wonderful how well this object is accomplished, even when the meshes are pretty wide, and the son's rays have very free access.

NETSCHER, GASPAR, or KASPAR, 1639–84; b. Germany; adopted by the physician Tullekens, who placed him under the instruction of Koster, a painter of poultry and objects of still life. He afterwards studied under Gerard Terburg at Deventer. He set out for Italy, where he intended to complete his studies, but having married at Bordeaux, he returned to Holland, and established himself at the Hague. He now took up portrait painting, having previously painted only small cabinet pieces. His best works are his musical and conversational pieces. He was a brilliant colorist, a master of light and shade, and very skillful in his treatment of accessories and draperies. Many of his pictures are in Louvre, at Dresden, Munich, or Florence. His eldest son, **Theodor**, 1661–1732, b. Bordeaux, was for many years a portrait painter in Paris, imitating his father's style, but inferior to him. He went to London in 1715, as paymaster of the forces, and being introduced at court, painted many of the principal persons in England, where he remained for six years. Kaspar's second son, **Constantine**, 1670–1732, was also a painter of some reputation, who followed closely the manner of his father.

NETSUKÉ, from the Japanese *ne* (wood or root) and *tsuké* (to suspend), a button of wood, crystal, or porcelain, but usually of ivory, by which the Japanese smoker suspends his outfit of tobacco, flint and steel, pipe, etc., from his girdle. Generally the netsuké is an elaborate work of art in carving, and is among the most characteristic products of native skill, portraying the fun, humor, grotesque or pathetic traits in human and animal nature, and illustrating the national legendary and historic lore. The best specimens have engraved on them the mark of the carver, and are very costly.

NETTING, Naval. A *boarding-netting* is formed of strong rope, and stretched above the bulwarks of a ship, over the port-holes, etc., to a considerable height, for the purpose of preventing the entrance of boarders from hostile boats. In positions where boat attacks are feasible, ships are thus protected at night, and at other times when attempts at boarding are anticipated.

The *hammock-netting* is in the bulwarks of a ship, usually in the waist, and its purpose is to keep the hammocks of the crew when stowed there during the day; thus netted together, the hammocks form a valuable barrier against bullets.

Hatchway-nettings are of inch rope, and are placed over the open hatchway during fine weather, to prevent persons from falling through.

NETTLE, *Urtica*, a genus of plants of the natural order *Urticeæ*, having unisexual flowers, the male and female on the same or separate plants; the male flowers with a 4-parted perianth, and four stamens; the female flowers with a 2-parted perianth and a tufted stigma; the fruit an achenium. The species are herbaceous plants, shrubs, or even trees, many of them covered with stinging hairs, which pierce the skin when touched, and emit an acrid juice, often causing much inflammation and pain. When a nettle is grasped in such away as to press the hairs to the stem, no stinging ensues; but the slighest inadvertant touch of some of the species produces very severe pain. The stinging of the native nettles of Europe is trifling in comparison with that of some East Indian species. *U. crenulata* is particularly notable for the severity of the pain which it produces, without either pustules or apparent inflammation. The first sensation is merely a slight tingling, but within an hour violent pain is felt, as if a red-hot iron were continually applied, and the pain extends far from the original spot, continues for about twenty-four hours and then abates, but is ready to return in its original intensity on the application of cold water, and does not cease for fully eight days. Cold water has a similar effect in increasing or renewing the pain of all kinds of nettles. Still more formidable than this species is *U. urentissima*, the *Devil's Leaf* of Timor. Of British species, the most venomous, but the most rare, is the Roman Nettle (*U. pilulifera*); next to it is the Small Nettle (*U. urens*), frequent about towns and villages, and in waste and cultivated ground; whilst the least venomous is the most common and only perennial species, the Great Nettle (*U. dioica*), everywhere abundant, but particularly near human habitations, or their former sites, the desolation of which it may be said to proclaim. The roots of nettles, boiled with alum, afford a yellow dye; and the juice of the stalks and leaves has been used to dye woolen stuffs of a beautiful and permanent green. The young shoots of *U. dioica* are used in some parts of Scotland and other countries as greens, and their peculiar flavor is much relished by some, although, in general, the use of them is confined to the poor; which, however, is probably the result of mere prejudice. Whatever it is that gives nettles their stinging power, is dissipated by boiling. The high value of nettles as food for swine, is well known to the peasantry of many countries; the great Nettle is cultivated in Sweden for fodder of domestic animals; nettles are also highly esteemed as food for poultry, particularly for turkeys. The seeds are extremely nutritious to poultry; and are given to horses by jockeys, in order to make them lively when they are to be offered for sale. The stalks and leaves of nettles are employed in some parts of England, for the manufacture of a light kind of beer, called *Nettle beer*, which may be seen advertised at stalls, and in humble shops in Manchester and other towns. The *bast* fiber of nettles is useful for textile purposes. Yarn and cloth, both of the coarsest and finest descriptions, can be made of it. The fiber of *U. dioica* was used by the ancient Egyptians, and is still used in Piedmont and other countries. When wanted for fiber, the plant is cut in the middle of summer, and treated like hemp. The names *Nettle Yarn* and *Nettle Cloth* are, however, now commonly given in most parts of Europe to particular linen and cotton fabrics.—The fiber of *U. cannabina*, a native of the south of Siberia and other middle parts of Asia, is much used; and from that of *U. Whitlawi*, both fine lace and strong ropes can be manufactured. The fiber of *U. Japonica* is much used in Japan, and that of *U. argentea* in the South Sea islands; that of *U. Canadensis* is used in Canada.—The seeds and herbage of *U. membranacea* are used in Egypt as emmenagogue and aphrodisiac; and somewhat similar properties are ascribed to *U. dioica.*—*U. tuberosa* produces tubers, which are nutritious, and are eaten in India, raw, boiled, or roasted.—Australia produces a magnificent tree-nettle, *U. gigas*, abundant in some parts of New South Wales, ordinarily from 25 to 50 ft. high, but sometimes 120 or 140 ft., with trunk of great thickness, and very large green leaves, which, when young, sting violently. In some places, it forms *scrub* forests, and its stinging leaves form a great impediment to the traveler.

NETTLE-RASH, or URTICA'RIA (Lat. *urtica*, a nettle), is the term applied to a common form of eruption on the skin. The eruption consists of wheals, or little solid eminences of irregular outline, and either white or red, or most commonly both red and white, there being a white center with a red margin. The rash is accompanied with great heat, itching, and irritation; the appearance on the skin and the sensation being very much like the appearance and feeling produced by the stinging of nettles: and hence the origin of its names.

The disease may be either acute or chronic. In the acute form, feverishness usually precedes the rash by a few hours, although sometimes they commence together. The disorder is always connected with some derangement of the digestive organs, and it may often be traced to the imperfect digestion of special articles of food, such as oatmeal, the kernels of fruit, strawberries, cucumbers, mushrooms, and especially oysters mussels, and crabs, which are eaten with perfect impunity by most persons. An hour or two after the offending substance has been swallowed, there is a feeling of nausea, with oppression about the pit of the stomach; the patient often complains of giddiness, and the face frequently swells; the skin then begins to tingle, and the eruption breaks forth; vomiting and diarrhea often supervene, and act as a natural cure; but even when they do not occur, the violence of the rash usually subsides in a few hours, and the disorder altogether disappears in a day or two.

The chronic form is often very troublesome; and frequently comes on periodically in the evening. Cases are reported in which persons have been afflicted for ten years continuously by this form of the disease. Patients have left off all their customary articles of diet, one by one, without in all cases meeting with relief; and hence it may be inferred, that although the disease depends in all cases on a disordered condition of the digestive organs, it is not always the consequence of some special offending article having been swallowed.

The main treatment of the acute form consists in expelling the offending matter by an emetic and by purgatives, and the cure is thus usually completed. In the chronic form, the patient should, in the first place, determine whether the rash is caused by any particular article of diet, and if this seems not to be the case, an attempt must be made to improve the state of the digestive organs. A few grains of rhubarb taken daily, just before breakfast and before dinner, will sometimes effect a cure. If this simple remedy fails, Dr. Watson recommends the trial of a draught composed of the infusion of serpentaria (about an ounce and a half), with a scruple each of the carbonates of magnesia and soda. He adds, that although external applications are usually of little avail, he has found that dusting the itching surface with flour sometimes affords temporary relief; and that a still more useful application is a lotion composed of a dram of the carbonate of ammonia, a dram of the acetate of lead, half an ounce of laudanum, and eight ounces of rose-water.

NETTLETON, ASAHEL, D.D., 1783–1844; b. Conn.; graduated at Yale college in 1809; studied theology at New Haven; was licensed to preach in 1811 by the West Congregational association of New Haven; ordained as an evangelist in 1817 by the South consociation of Litchfield county. He commenced study with the view of being a missionary, but his services being in great demand, and his preaching very successful, he was led to consider it his duty to remain at home. For several years he preached in some of the largest and most important towns in Connecticut with great effect. In 1822 he had an attack of typhus fever, from the effects of which he never entirely recovered. In 1827 he visited Virginia for his health, and on his return in 1829, preached for two years in New York and New England. In 1831 he visited England, preaching there, and in Scotland and Ireland. After his return he was appointed in 1832 professor of pastoral theology in East Windsor theological seminary. He declined the professorship, but resided in the place, and lectured for several years to the students. His sermons were extemporaneous and generally doctrinal and argumentative, but with fervent appeals to the conscience. His style and manner were deeply solemn, to which impression his various methods in the conduct of his meetings contributed. He was a decided opponent of Dr. Taylor's (New Haven) theological views. He published a small hymn-book, entitled *Village Hymns*, which was very popular and widely used. His *Remains and Sermons* were edited by Dr. B. Tyler, who published also a *Memoir*, which was republished in Edinburgh, and revised by Dr. A. A. Bonar.

NETTLE-TREE, *Celtis*, a genus of deciduous trees of the natural order *ulmaceæ*, with simple and generally serrated leaves, considerably resembling those of the common nettle, but not stinging. The genus is distinguished chiefly by its fruit, which is a fleshy, globose, or sub-globose 1-celled drupe. The common or European nettle-tree (*C. Australis*) is a native of the s. of Europe, the w. of Asia, and the n. of Africa. It grows to the height of 30 to 40 ft., and is a very handsome tree, often planted along public walks in the s. of France and n. of Italy. The wood is very compact, very durable, and takes a high polish. It was formerly much imported into Britain for the use of coachmakers. It is used in Italy by musical instrument makers for flutes and pipes. The flowers are inconspicuous, axillary, and solitary; the fruit black, resembling a small wild cherry, not eatable till after the first frosts, and then very sweet. The kernel yields a useful fixed oil. The tree succeeds well in the s. of England.—*C. occidentalis* is a native of North America from Canada to Carolina, sometimes there called the nettle-tree, sometimes the SUGAR BERRY. Its leaves are much broader than those of *C. Australis*, its fruit very similar. It is a much larger tree, attaining a height of 60 to 80 feet.—Another American species, *C. crassifolia*, often called HACKBERRY or HAGBERRY, and HOOP ASH, is very abundant in the basin of the Ohio and westward of the Mississippi. It grows to a great height, but the trunk is not very thick. The wood is not much valued, but is said to make very fine charcoal. The fruit is black, and about the size of a pea.—The inner bark of *C. orientalis*, consisting of reticulated fibers, forms a kind of natural cloth, used by some tribes of India.—A number of other species are natives of the warm parts of America and of Asia.

NEU-BRAN'DENBURG, a t. of Mecklenburg-Strelitz, the prettiest, and after the capital, the largest in the duchy, is situated on lake Tollens, 17 m. n.n.e. of Neu-Strelitz. It is regularly built, contains two churches, a castle, etc., is the center of a picturesque district, and the seat of considerable industry. Pop. '75, 7,495.—About half a league from Neu-Brandenburg, on a rock overlooking lake Tollens, stands the ducal pleasure-castle of Belvedere, commanding, it is said, the most beautiful prospect in Mecklenburg.

NEU'BURG, an ancient t. of Bavaria, is picturesquely situated on the right bank of the Danube, 29 m. n.n.e. of Augsburg. It contains a handsome palace, the château of the dukes of Bavaria of the line of Pfalz-Neuburg, who resided here from 1596 to 1742. The palace contains a collection of ancient armor. Brewing and distilling are carried on, and there is a considerable commercial trade on the Danube. Pop. '75, 7,291.

NEU-CHWANG, or YING-TSZE, a t. of the Chinese empire, in Manchuria. It stands on the left bank of the river Liaou, about 25 m. from its mouth, and in lat. 41° n., and long. 122° 30' east. The Liaou, which falls into the gulf of Liaou-tong, at the head of the Yellow sea, is navigable for sea-going vessels to Neu-Chwang; and Neu-Chwang is therefore regarded as a seaport, and is one of those opened to foreign trade by the treaty of Tientsin. A British consul resides here; but the trade is as yet inconsiderable, and only to Chinese ports.

NEUFCHATEL', or NEUCHATEL, known also as *Neuenburg*, a canton in the w. of Switzerland, between lake Neufchatel and the French frontier. Area, 310 sq. miles. Pop. '70, 97,284; '78, about 103,850. Above 17,000 families speak French, and 2,700 German. Neufchatel lies in the midst of the Jura mountains, four chains of which, running from n.e. to s.w., traverse the canton, and are separated by elevated longitudinal valleys. The most easterly of these is a broken chain, running parallel to the lake of Neufchatel, on whose banks, and on the second and lower ranges beyond it, the vine is carefully cultivated. This second chain has five principal passes, the highest of which, La Tourne, has an elevation of about 4,000 feet. The third and fourth ranges, abutting on France, consist for the most part of barren hills, separated by elevated valleys; but here and there these high lands are well wooded and fruitful, producing corn, good pasture, fruits, etc. The greater number of the numerous streams which water the canton flow into the Rhine. Among these mountain torrents the principal are the Reuse, the Seyon, and the Serriere, the two former of which, together with the rivers Orbe and Broie, are the feeders of the lake of Neufchatel, known also as the lake of Yverdun. The Thiele serves as its outlet, and carries its waters into the neighboring lake of Bienne, and into the river Aar. The lake is 25 m. long and from 8 to 5½ m. wide. Its level above the sea is 1420 ft., and it has a depth of 400 or 500 feet.

The natural products are iron ores, coal, asphalt, fruit, including grapes—from which good red and white wines are made—timber and corn, although the latter is not grown in sufficient quantity for the demands of the home consumption. The rearing of cattle constitutes an important branch of industry, and large quantities of cheese are exported; but the specialty of the canton is watch-making, which occupies from 18,000 to 20,000 persons, and is prosecuted in detail at the homes of the work-people, in the rural districts, where some families manufacture only special parts of the machinery, while others are engaged solely in putting together the separate portions that have been manufactured by others; and the watches thus prepared are exported in large quantities to every part of Europe and America. Muslin-printing employs upwards of 10,000 persons, and lace is extensively made by the country-women of the Val de Travers.

The climate of Neufchatel varies greatly with the locality; being temperate on the shores of the lake, cooler in the valleys, and severe on the mountain-sides. The population, with the exception of between 9,000 and 10,000 Catholics, belongs to various Protestant denominations.

The history of Neufchatel was identical with that of Burgundy till the 11th c.; and after the principality had been for a time incorporated with the territories of the counts of Chalons, to whom it had been granted in 1288 by Rudolph of Hapsburg, it passed to the house of Longueville. In 1707, on the extinction of the Neufchatel branch of the latter family, 15 claimants came forward to advance more or less valid pretensions to the Neufchatel territory. Frederick I. of Prussia, who based his claim to the principality of Neufchatel on the ground of his descent from the first prince of Orange, a descendant of the house of Chalons, was the successful candidate; and from his time it continued associated with Prussia till 1806, when Napoleon bestowed it upon gen. Berthier; but in 1814 it was restored to the house of Brandenburg. This connection with the Prussian monarchy has been wholly dissolved since 1857, and Neufchatel is now a member of the Swiss confederation.

NEUFCHATEL, or NEU'ENBURG, is the chief t. of the canton, and occupies a magnificent site on the n.w. shore of the lake of Neufchatel, and is noted for its many charitable institutions, and for the beauty of its charmingly situated environs. Pop. '70, 13,321.

NEU'HAUS, a t. of Bohemia, on the Nescharka, about 70 m. s.s.e. of Prague. Its palace, belonging to count Czerny, is a splendid edifice. Cloth, paper, and chemical products are manufactured. Pop. '69, 8,620.

NEU'HAUSEL (Hung. *Ersek-Ujvár*), a t. of Hungary, on the right bank of the Neutra, 74 m. n.w. of Pesth, by the Vienna and Pesth railway. It was formerly strongly fortified, and played an important part in the Turkish wars. No traces of its fortifications now remain. Pop. '69, 9,483, chiefly engaged in agriculture and the rearing of cattle.

NEUHOF, THEODOR VON, Baron, 1686–1756; b. in Metz, Westphalia; became a lieut. in an Alsace regiment, but soon left on account of his poverty, indebtedness, and, it is said, a duel. From this time he wandered about Europe, making use of his title and address to contract new debts. In Spain he met with some success, was offered a colonel's commission, and was engaged to marry one of the queen's ladies of honor. Finding that her dowry was less than represented, he fled with her jewels. In 1735 he became interested in the Corsican movement to assert the independence of Genoa, and in the following year persuaded the dey of Tunis to intrust to his command two regiments, with supplies and ammunition. Landing in Corsica in March, he was received with enthusiasm. Exaggerated and totally false ideas as to his rank in nobility and his influence with the governments of Europe were promulgated, and in April he was elected king under the title of Theodore I. His reign lasted but eight months, during which time he made great display personally and formed a new order of knighthood. His promises of foreign assistance were not realized, though the Netherlands made some vague treaty of alliance; and when in 1738 the French came to the aid of the Genoese, the Corsican cause was lost and Neuhof fled. After the departure of the French, 1741–42, Neuhof found that his popularity had vanished and that his life was in danger. He fled again to England, where he was imprisoned for debt by his Dutch creditors (he had in 1738 mortgaged two Corsican cities for funds to carry on the war), and was released in 1756, a few months before his death, by the assistance and intercession of Horace Walpole.

NEUILLY (sometimes called NEUILLY-SUR-SEINE, to distinguish it from several much less important places of the same name), a t. of France, in the department of Seine, on the right bank of the river Seine, immediately to the n. of the Bois de Boulogne. Neuilly may now be regarded as a suburb of Paris, with which it is connected by several streets, or roads, lined with numerous villas. Here, near the Seine, and in a large and beautiful park, formerly stood the château de Neuilly, built by Louis XV., and the favorite residence of Louis Philippe, which was burned at the revolution in 1848. The park was also then divided into lots for sale, the consequence being a rapid increase of the number of houses in Neuilly. Neuilly has manufactures of porcelain and starch, chemical works, and distilleries. Pop. '72, 15,466. When Louis Philippe abdicated, and took refuge in England, he assumed the title of count de Neuilly.

NEUKOMM, SIGISMUND, 1778–1858; b. Germany; studied under Michael and Joseph Haydn, and in 1804 became leader of the German opera. In 1816 he went to Rio Janeiro, and was appointed music teacher to the court. He returned in 1821, and lived at Talleyrand's house in Paris. He composed many cantatas, symphonies, sonatas, etc., and two successful oratorios, *Mount Sinai*, 1831; and *David*, 1834.

NEUMANN, KARL FRIEDRICH, 1798–1870; b. in Bavaria; educated at the universities of Heidelberg, Munich, and Göttingen; afterwards studied in Paris and Vienna. Of Jewish birth, he became converted to Christianity and joined the Lutheran sect. In 1829 he traveled in China and India, making a very large collection of books in the native languages. From 1831 to 1852 he was professor of oriental languages at the university of Munich; but his political views caused his dismissal. It was after this that he wrote his *Geschichte der Vereinigten Staaten von Amerika*, and *Hocin Schein*, an account of the alleged discovery of America by Buddhist monks. He also published very many pamphlets and papers relating for the most part to oriental languages and literature, especially those of the Armenians.

NEU'MUNSTER, a prosperous manufacturing and market town of Holstein, on the Schwale, one of the head-waters of the Stoer, and on the railway between Altona and

Kiel, 19 m. s. by w. from Kiel. There are large woolen and linen factories, tanneries, dye-works, and breweries. Pop. '75, 10,124.

NEURAL'GIA (Gr. *neuron*, a nerve; *algos*, pain) is a term employed to designate pain of a purely nervous character, usually unaccompanied by inflammation, fever, or any appreciable change of structure. The pain, which occurs in paroxysms, usually followed by complete remissions, is of every possible degree and character, being described in different cases as piercing, tearing, burning, etc. These paroxysms may occur at intervals of a few seconds only, or they may take place daily or on alternate days, or they may be separated by much longer intervals, which are often, but by no means always, of a regular length. With the pain there is frequently spasmodic twitching of the adjacent muscles. The duration of the disease is very uncertain. The patient may have only a single attack, or he may be liable to recurring attacks for months, years, or even for his whole life; it is, however, very seldom that the disease occurs but once. Death scarcely ever results directly from this affection, but the pain may, by its severity and persistence, gradually undermine the constitution.

The disease may attact any part of the body where there are nerves; but in no part does it occur so frequently as in the face, when it is popularly known as *tic-douloureux;* its seat being in the facial branches of the fifth pair of nerves (the trifacial nerves). The following graphic description of the ordinary varieties of this form of neuralgia is borrowed from Dr. Watson's *Lectures on the Principles and Practice of Physic:* "When the uppermost branch of the trifacial nerve is the seat of the complaint the pain generally shoots from the spot where the nerve issues through the superciliary hole; and it involves the parts adjacent, upon which the fibrils of the nerve are distributed—the forehead, the brow, the upper lid, sometimes the eyeball itself. The eye is usually closed during the paroxysm, and the skin of the forehead on that side corrugated. The neighboring arteries throb, and a copious gush of tears takes place. In some instances the eye becomes blood-shotten at each attack; and when the atttacks are frequently repeated, this injection of the conjunctiva may become permanent.

"When the pain depends upon a morbid condition or morbid action of the middle branch of the nerve it is sometimes quite sudden in its accession, and sometimes comes on rather more gradually; being preceded by a tickling or pricking sensation of the cheek, and by twitches of the lower eyelid. These symptoms are shortly followed by pain at the infra-orbitary foramen, spreading in severe flashes (so to speak) over the cheek, affecting the lower eyelid, ala nasi, and upper lip, and often terminating abruptly at the mesial line of the face. Sometimes it extends to the teeth, the antrum, the hard and soft palate, and even to the base of the tongue, and induces spasmodic contractions of the neighboring muscles.

"When the pain is referrible to the inferior or maxillary branch of the fifth pair of nerves it darts from the mental foramen, radiating to the lips, the alveolar processes, the teeth, the chin, and to the side of the tongue. It often stops exactly at the symphysis of the chin. Frequently it extends in the other direction, to the whole cheek and to the ear. During the paroxysm the features are liable to be distorted by spasmodic action of the muscles of the jaw, amounting sometimes to tetanic rigidity, and holding the jaw fixed and immovable.

"The paroxysms of suffering in this frightful disease are apt to be brought on by apparently trival causes—by a slight touch, by a current of air blowing upon the face, by a sudden jar or shake of the bed on which the patient is lying, by a knock at the door, or even by directing the patient's attention to his malady by speaking of it or asking him questions about it. The necessary movements of the face in speaking or eating are often sufficient to provoke or renew the paroxysm. At the same time, firm pressure made upon the painful part frequently gives relief, and causes a sense of numbness to take the place of the previous agony" (vol. i. pp. 723–24).

Tic-douloureux in the form of severe neuralgia which is by far the most commonly met with; the reason probably being that the trifacial nerve lying superficially, and being distributed over a part of the surface which is usually unprotected by any artificial covering, is very liable, for that reason, to be affected by exposure to atmospheric influences, which are undoubtedly to be included among the exciting causes of this disease. Amongst other seats of neuralgia may be mentioned the arm, especially the fore-arm, the spaces between the ribs, especially between the sixth and ninth, and the lower extremity, where it most frequently affects the sciatic nerve, giving rise to the affection known as SCIATICA, which, however, not always being pure neuralgia, will be noticed in a separate article.

The causes of neuralgia are various. Excluding inflammation of the nervous trunk or *neuritis*, the pain may be excited by a tumor pressing on the nerve, or originating in its substance; or by roughness of a bony surface with which the nerve may be in contact, as when it passes through a foramen: or it may be due to tumors within the cranium, or a morbid state of the spinal cord. Sometimes, again, irritation applied to *one* branch of a nerve will give rise to pain at the extremity of *another* branch of the same nerve, the sensation being reflected along the branch which is not directly exposed to the irritation. In this way we may explain the pain in the shoulder which often accompanies disease of the liver; the pain in the thigh which is often associated with irritation of the kidney; the pain in the left arm which is often coincident with disease of the heart, etc. Persons suffering from debility, anæmia, and a gouty or rheumatic constitution, are so especially liable to neuralgia that these conditions—as also exposure to malarious influences—must be placed among the the predisposing causes. Amongst the exciting causes, exposure to cold and wet, or to a cold dry east wind, is the most frequent; but fatigue, strong mental emotions, the abuse of tea, coffee, tobacco, and alcholic drinks, a wound or bruise, the retrocession of gout, rheumatism, or cutaneous eruptions, etc.. occasionally suffice to excite the disease.

The resources of the materia medica have been exhausted in searching for remedies for this cruel disease. Dr. Elliotson believes that "in all cases of neuralgia, whether exquisite or not, unaccompanied by inflammation, or evident existing cause, iron is the best remedy;" and there can be no doubt that, when the disease is accompanied with debility and paleness, no remedy is likely to be so serviceable. If the digestive organs are out of order, the neuralgia may not unfrequently be removed or alleviated by correcting their unhealthy state. "Dr. Rigby tells us that having suffered in his own person an intense attack of tic-douloureux, which opium did not assuage, he swallowed some carbonate of soda dissolved in water. The effect was almost immediate; carbonic acid was eructed, and the pain quickly abated. In this case, the pain depended upon the mere presence of acid in the stomach. More often the cause of offense appears to lie in some part of the intestines; and purgatives do good. Sir Charles Bell achieved the cure of a patient upon whom much previous treatment had been expended in vain, by some pills composed of cathartic extract, croton oil, and galbanum. He mixed one or two drops of the croton oil with a dram of the compound extract of colocynth; and gave five grains of this mass, with 10 grains of the compound galbanum pill, at bedtime. Other cases have been since reported, both by sir Charles and by others, in which the same prescription was followed by the same success."—Watson, *op. cit.* p. 727.

When the disease occurs in a rheumatic person, iodide of potassium (from three to five grains taken in solution three times a day before meals) sometimes gives great relief. When the paroxysms occur periodically—as, for example, with an interval of 24 or 48 hours—sulphate of quinine in doses of from 10 to 20 grains between the paroxysms, will usually effect a cure; and if the disease resist comparatively small doses, the quantity may be increased to half a dram, or a dram if necessary. Arsenic acts in the same manner as quinine in these cases, but usually less effectually.

The inhalation of chloroform will sometimes give permanent relief, and always gives temporary ease, and shortens the period of suffering.

The injection of a certain quantity of a solution of muriate of morphia, by means of a sharp-pointed syringe, into the cellular tissue beneath the skin over the painful spot, very often gives immediate relief. For the discovery of this mode of treating neuralgia, we are indebted to Dr. Alexander Wood of Edinburgh. At one time—about half a century ago—it was a common practice to divide the trunk of the painful nerve, with the object of cutting off the communication between the painful spot and the brain; but in many instances the operation signally failed, and it is now never resorted to. A much simpler operation, namely, the extraction of a canine tooth, has often been found to give permanent relief in cases of facial neuralgia, and in such case a careful examination of the teeth should usually be made.

Local applications can be of no permanent service in cases where the pain results from organic change, or from general constitutional causes; they will, however, often give considerable temporary relief. Amongst the most important local applications may be mentioned laudanum, tincture of aconite (or aconitina ointment, in the proportion of one or two grains to a dram of simple ointment or cerate), belladonna plaster, and chloroform (which should be applied upon a piece of linen saturated with it, and covered with oiled silk, to prevent evaporation).

Lastly, neuralgia being a purely nervous affection, is often influenced by means calculated to make a strong impression on the mind of the patient: and hence it is that galvanic rings, electric chains, mesmeric passes, homeopathic globules, and other applications, which, like these, act more upon the mind than upon the body of the patient, occasionally effect a cure.

NEURI'TIS is the term applied to inflammation of the nerves. The disease is rare and not very well defined. The symptoms closely resemble those of neuralgia. Rheumatism seems, in most cases, to be the cause of the disease, which must be treated by bleeding, leeching, purging, and low diet. Anodynes are also required for the relief of the pain; and of these, Dover's powder, in tolerably full doses, is perhaps the best.

NEUROP'TERA (Gr. nerve-winged), an order of mandibulate insects, having four nearly equal and membranous wings, all adapted for flight, divided by their nervures into a delicate net-work of little spaces, and not covered with fine scales, as in the *lepidoptera*. The wings are often extended horizontally when at rest, nearly as in flight; but the position is various. The form of the wing is generally somewhat elongated. The body is generally much elongated, particularly the abdomen. The head is often large, the compound eyes very large, and there are often also simple or stemmatic eyes. The habits are predaceous, at least in the larva state; often also in the pupa and perfect states, the food consisting of other insects, often caught on the wing. The power of flight is accordingly great in many. The larvæ and pupæ are often aquatic. The females have no sting, and only a few have an ovipositor. The metamorphosis is complete in some, incomplete in others. Dragon flies, May flies, scorpion flies, ant-lions, and termites, or white ants, belong to this order.

NEUROT'ICS (Fr. *nérrotique;* Gr. νεῦρον, a nerve), a word recently come into use to specify such drugs as tend to affect principally and specifically the nerves of thought and motion. Alcohol, ether, chloral, opium, potassium, bromide, amyl-nitrate, strychnine, quinine, aconite, and digitalis are examples of drugs to which this name may be applied.

NEU'SATZ (also *Neoplanta* or *Uj-Vidék*), a t. of the Austrian empire, in the Hungarian province of Bács, is situated on the left bank of the Danube, opposite Peterwardein. Its origin dates from the year 1700, and by the year 1849 it numbered nearly 20,000 inhabitants. A bridge, 840 ft. in length, extends between Neusatz and the town and fortress of Peterwardein. Neusatz is the seat of the Greek non-united bishop of Bács. On June 11, 1849, it was taken from the Hungarian insurgents by the imperial troops, and was almost wholly destroyed. It has been rebuilt in excellent style. Neusatz is a station for steamers on the Danube, and carries on an important and active trade. Pop. '69, 19,119.

NEUSE, a river of North Carolina, rises near the middle of the northern boundary of the state, and, after a south-easterly course of 250 m., falls by a broad channel into Pamlico sound, which communicates by several inlets with the Atlantic ocean. It forms the harbor of New Berne.

NEU'SIEDL, LAKE (Hung. *Ferto-tava*), a small lake on the n.w. frontier of Hungary, 22 m. s.e. of Vienna. It is 23 m. in length, and about 6 m. in average breadth, with a mean depth of 13 feet. Its waters are light-green in appearance, and are brackish in taste. The slopes of the Leitha mountains in the vicinity produce excellent wine.

NEU'SOHL (Hung. *Besztercze-Bánya*), a beautiful and thriving t. of Hungary, the chief place of the richest mining district in the country, is situated in a hill-inclosed valley on the right bank of the Gran, about 85 m. n. of Pesth. Neusohl, consisting, as it does, of the town proper and five suburbs, contains a population, in all, of (1869) 11,780, who are employed in the copper and iron mines of the vicinity, in the smelting-houses, and in the manufacture of beet-root sugar, paper, colors, etc. It is the seat of a bishop, and contains a beautiful cathedral, a bishop's palace, and two evangelical churches, and several other handsome edifices.

NEUSS, a fortress and flourishing manufacturing t. of Rhenish Prussia, near the left bank of the Rhine, with which it is connected by the river Erft, 4 m. s.w. of Düsseldorf. Its church of St. Quirinus, a beautiful edifice, and a noble specimen of the transition from the round to the pointed style, is supposed to have been built in 1209. Neuss is the principal grain-market of the province, and carries on manufactures of woolen and other cloths, ribbons, hats, vinegar, etc. It is supposed to be the *Novesium* of the Romans, sacked by Attila in the year 451. Pop. '75, 15,563.

NEU'STADT (Polish, *Prudnitz*), a t. of Prussian Silesia, 29 m. s.w. of Oppeln. It is the seat of considerable manufacturing industry, woolen and linen fabrics being the staple goods manufactured. Damask-weaving alone employs 660 hands, and 380 looms. Pop. '75, 12,515.

NEUSTADT, or WIENER-NEUSTADT, one of the most beautiful t. of lower Austria, called, from its loyalty, "the ever-faithful town" (*ewig getreue Stadt*), is situated 28 m. s. of Vienna, on the Vienna and Gloggnitz railway, and is also connected with the capital by a canal. It is surrounded by a broad and deep ditch, and by a fortified wall pierced by four gates. The town is overlooked by the large old castle of the dukes of Babenberg, now a military academy for the preparatory instruetion of officers of the line. It accommodates from 400 to 500 pupils. The castle contains a fine Gothic chapel (date, 1460), rich in painted windows. It is the burial place of the emperor Maximilian I. On Sept. 14, 1834, the whole town, with the exception of 14 houses, was destroyed by a dreadful conflagration, which involved the loss of many lives. The new town has been laid out with great taste and regularity. The canal (40 m. in length) and the railway to Vienna, and the converging roads from Styria and Hungary, are the sources of the prosperity of the town. In Neustadt machinery is extensively constructed; and sugar-refining and manufactures of silk, velvet, and cotton fabrics, fayence, leather, etc., are carried on. Pop. '69, 18,070.

NEUSTADT AN DER HARDT, a small t. of Rhenish Bavaria, charmingly situated on the Speyerbach, at the foot of the Hardt mountains, 12 m. n. of Landau. Its church, with several curious monuments of the counts palatine, and with some ancient fresco-paintings, was finished in the 14th century. It carries on manufactures of paper, cloth, oil, brandy, etc. Pop. '75, 10,224.

NEUSTADT-E'BERSWALDÉ (since 1876 called officially *Éberswalde* only), a t. of Prussia, in the province of Brandenburg, 28 m. n.e. of Berlin. It is well known on account of its mineral springs, and carries on extensive manufactures in steel, iron, copper, brass, paper, and porcelain. Pop. '75, 10,069.

NEU'STADTL AN DER WAAG, a t. near the n.w. frontier of Hungary, 33 m. n.n.w. of Neutra. Here excellent red wine is grown, and there is a good trade in grain, wool, sheep-skins, and wax. Pop. '69, 5,451, nearly half of whom are Jews.

NEUSTETTIN', a t. of Prussia in the province of Pomerania, 92 m. s.w. from Dantzic, on the southern shore of the Vilm See. It is the capital of a circle, and a place of some importance. Pop. '75, 6,971.

NEU-STREL'ITZ, the capital and the residence of the court of the grand duchy of Mecklenburg-Strelitz, pleasantly situated in a hilly district, between two lakes, 60 m. n.n.w. of Berlin. It was founded in 1733, is built in the form of an eight-rayed star, and contains the ducal palace, with a library of 70,000 vols., and having magnificent gardens attached. Pop. '75, 8,525, supported chiefly from the expenditure of the court, and by brewing and distilling. A mile s. of the town is Alt-Strelitz, with the largest horse-market in the duchy.

NEU'STRIA, or WEST FRANCE (*Francia occidentalis*), the name given in the times of the Merovingians and Carlovingians to the western portion of the Frank empire, after the quadruple division of it which took place in 511. Neustria contained three of these divisions. It extended originally from the mouth of the Scheldt to the Loire, and was bounded by Aquitania on the s., and by Burgundy and Austrasia (*Francia orientalis*), on the east. The principal cities were Soissons, Paris, Orleans, and Tours. Bretagne was always loosely attached to Neustria, of which the strength lay in the duchy of France. After the cession of the territory afterward called Normandy to the Normans in 912, the name Neustria soon fell into disuse.

NEUTERS, an Indian tribe, so named by the French from the neutrality observed by them in the wars between the Hurons and Iroquois tribes, between which they were situated. They lived on the banks of the Niagara. In 1649 the Neuters were conquered by the Iroquois, the larger part killed, and the rest incorporated in the Five nations. Early efforts to establish missions among them were not successful.

NEU'TITSCHEIN, a small manufacturing town of Moravia, on the Titsch, 80 m. n.e. of Brünn. It contains an old castle, and carries on manufactures of cloth and woolen-goods, dyeing, and wagon-making. Pop. '69, 8,645.

NEUTRA, a co. in n.w. Hungary, having Moravia for its n.w. boundary, and a range of the Carpathian mountains; 2,219 sq.m.; pop. '70, 361,005. It is drained by the Neutra, March, and Waag rivers, head-waters of the Danube. Its surface is hilly, and its pasturage excellent; and it exceeds all other localities of Hungary in the number of cattle and sheep raised. Its trade, carried on principally with the province of Moravia, is very active. Its manufactures are the products of the loom, linen, cotton, and woolen-goods. Its soil is adapted to vine-culture, and much wine is exported, *Neustadtler* being considered the most desirable. Capital, Neutra.

NEU'TRA, a t. of Hungary, the capital of a county of the same name, on a river of the same name, 72 m. n.n.w. from Pesth. Neutra is a very old town, having been the residence of a Moravian prince in the 9th c., before the Magyar invasion. Weaving is carried on to some extent; and Neutria, being not far from the Moravian frontier, has a considerable transit-trade. Pop. '69, 10,683.

NEU'TRAL AXIS, the name given to an imaginary line to any body which is being subjected to a transverse strain; and separating the forces of extension from those of compression. If the ratio of the resistances to extension and compression were the same for all substances, and depended merely on the form of the body, then in all bodies of the same form the neutral axis would have a definite geometrical position; but it has been satisfactorily proved by Mr. Eaton Hodgkinson that this ratio has a separate value for each substance. In wood, where the ratio is one of equality, the neutral axis in a beam supported at both ends, whose section is rectangular, passes lengthwise through the center of the beam; while in cast-iron, in which the resistance to compression is greater than that to extension, it is a little above, and in wrought-iron, in which the contrary is the case, it is a little below, the center.

NEUTRAL SALTS. See SALTS.

NEUTRALS, nations who, when a war is being carried on, take no part in the contest, and evince no particular friendship for or hostility to any of the belligerents. As a general rule neutrals should conduct themselves with perfect impartiality, and do nothing which can be considered as favoring one belligerent more than another.

The duties and obligations of neutrals at sea have given rise to many complicated questions. It is allowed on all hands that a neutral state forfeits her character of neutrality by furnishing to either belligerent any of the articles that come under the denomination of contraband of war (q.v.). If she does so, the other belligerent is warranted in intercepting the succors, and confiscating them as lawful prize. Contraband of war, besides warlike stores, has sometimes been held to include various other articles, a supply of which is necessary for the prosecution of the war; and it has been doubted how far, in some circumstances, corn, hay, and coal may not come under that category.

An important question regarding the rights of neutrals is, whether enemies' goods not contraband of war may be lawfully conveyed in neutral bottoms. The principle that free ships make free goods was long resisted by this and other maritime countries; and the general understanding has been that belligerents have a right of visiting and searching neutral vessels for the purpose of ascertaining—First, whether the ship is really neutral, as the hoisting of a neutral flag affords no absolute security that it is so; Second, whether it has contraband of war or enemies' property on board. Neutral ships have therefore been held bound to provide themselves with passports from their government, and such papers as are necessary to prove the property of the ship and cargo; and it is their duty to heave to when summoned by the cruisers of either belligerent. It has been considered that a neutral ship which seeks to avoid search by crowding sail, or by open force, may be captured and confiscated. When a merchant-ship is sailing under convoy of a vessel of war it has been said that the declaration of the officer in command of the convoy that there is no contraband of war or belligerent property on board is sufficient to bar the exercise of the right of search.

A declaration having important bearings on the rights of neutrals was adopted by the plenipotentiaries of Great Britain, Austria, France, Prussia, Russia, Sardinia, and Turkey, assembled in congress at Paris on April 16, 1856. By its provisions, 1. Privateering is abolished. 2. A neutral flag covers enemies' goods, with the exception of contraband of war. 3. Neutral goods, with the exception of contraband of war, are not liable to capture under the enemy's flag. 4. Blockades, in order to be binding, must be effective—that is, maintained by a force sufficient really to prevent access to the coast of the enemy.

It has sometimes been proposed to exempt private property at sea from attack during war. Such a project, however, seems inexpedient. There may be a propriety in respecting the property of individuals on land in a time of war, because its destruction, however injurious to the persons immediately concerned, can have little influence on the decision of the contest. But at sea private property is destroyed, because those from whom it is taken, being purveyors or carriers for the community at large, its loss must seriously affect the public, and have no small influence in bringing the contest to an end. See BLOCKADE, PRIVATEER.

NEU'WIED, a t. of Rhenish Prussia, on the right bank of the Rhine, 8 m. below Coblenz. It is the capital of the principality of Wied, now mediatized and attached to Prussia, and is the seat of the princes of Wied, with a beautiful castle. It was founded in the beginning of the 18th c. by prince Alexander of Wied-Newweid, who, offering perfect toleration in religious matters, as an inducement, invited colonists of whatever persuasion to settle here. The town is well built, with wide, straight streets, running at right angles to each other, and contains the churches of Protestants, Catholics, Jews, Herrnhuters, etc. The inhabitants are well-conditioned, and industrious. Pop. '75, 9,474, who carry on manufactures of hosiery, woolen and cotton fabrics, iron-wares, leather, and tobacco.

NE'VA, a river of Russia, in the government of St. Petersburg, flows westward from the s.w. corner of lake Ladoga to the bay of Cronstadt, in the gulf of Finland. Its length, including windings, is about 40 m., 9 m. of which are within the limits of the city of St. Petersburg; and in some places it is 2,100 ft. broad, and about 56 ft. deep; although at Schlusselburg, where it issues from the lake, and at St. Petersburg, where it enters the sea by several branches, it is shallow. From Cronstadt, goods are brought to St. Petersburg in lighters or in small steamers. By the Ladoga canal the n. communicates with the vast water-system of the Volga, and thus it may be said to join the Baltic with the Caspian sea. Its current is very rapid, and the volume of its waters is immense. It is covered by drift-ice for upward of five months—from about Nov. 25 to April 27. An extensive traffic is carried on on its waters, both from the interior, and from the Baltic.

NEVA'DA, one of the states of North America, is bound on the w. by California; on the s. by California and Arizona; on the e. by Utah and Arizona; and on the n. by Oregon and Idaho. Lat. 35° to 42° n.; long. 114° to 120° w.; area, 104,125 sq. miles. The population in 1870 was 42,491 (including 3,152 Chinese), besides 4,000 tribal Indians. The chief river is the Humboldt. The principal lakes are the Mud lakes, Pyramid lakes, and the Walker and Carson lakes. Nevada is the center of that elevated basin which reaches westward from the Rocky mountains to the Sierra Nevada, at a mean altitude of about 4,000 ft. above the level of the sea. Numerous mines, either of gold or silver, have been discovered. The whole country is rich in mineral wealth. Besides gold and silver, quicksilver, lead, and antimony are found. The territorial capital is Carson city (pop. 3,042); but the principal town is Virginia city (pop. 7,048). The product of silver in Nevada during the decade 1859 to 1869 was valued at $137,382,000; in 1875 its value was about $40,478,369.

NEVADA (*ante*) is a portion of the territory acquired by the United States from Mexico under the treaty of Guadalupe Hildalgo, belonging previous to its transfer to the "department of Alta California." Prior to its acquisition by the government it was inhabited only by the aboriginal races, there being no settlement of civilized people, not even a mission, within its borders. The first settlements were made in 1848 by the

Mormons, some of whom, in passing back and forth between California and Salt lake, observing the excellence of the land, located in the Carson and Washoe valleys. The following year they were joined by a few adventurers, who, attracted by the gold discoveries in California, had made the journey overland, but stopped on finding here the object for which they had set out. From this time the population gradually increased until in 1859, when silver was discovered, it had swelled to about 1000 people. During the next two years it increased to 17,000; and, as stated above, by the returns of the census of 1870, the population was 49,491. It was constituted a territory in Mar., 1861, and was admitted into the union as a state in Oct., 1864.

Viewed as a whole, geographically, the state, in common with the great American basin of which it forms a part, may be considered an elevated plateau, having a general altitude of more than 4,000 ft. above tide-water. Traversing this lofty plain are numerous chains of mountains, separated by valleys having a width varying from 5 to 20 m., and usually about equal to that of the adjacent mountains measured through their bases. The course of these valleys is, as a general thing, parallel to the main axis of the mountains, which have for the most part a northerly and southerly strike. These mountains vary in height from 1000 to 5,000 ft. above the common level of the country, having therefore an absolute elevation of from 5,000 to 9,000 ft. above the sea. For a distance of nearly 300 m. the Sierra Nevadas form a natural barrier along its western and south-western border, the boundary line between this state and California running partially upon its summit and partially along or near the eastern base of this range, which, though not here attaining its greatest altitude, has nevertheless within the limits of Nevada a general height of more than 7,000 ft., a few of the loftier peaks reaching a height of 10,000 feet. The mountains are covered nearly everywhere from base to summit with a growth of forests, consisting of a variety of pine, spruce, and fir, which are well adapted to make superior lumber. No oak or other hard wood of any size is found on this slope of the Sierra, nor, indeed, in any other part of Nevada. The alternation of mountains and valleys is preserved with much regularity throughout the state, being most marked in the central portion. Sometimes the former contract or are so broken up as to transform the valleys into broad plains or basins, some of which are open and unobstructed, while others are covered with isolated clusters of rugged hills. Through a few of these run streams of water supplied from the mountain rills, and in these much of the land is arable, the quantity usually being proportioned by the size of the stream. In the valleys, however, that have no streams there is scarcely any land that can be used for agriculture. In fact, the more extended plains are marked by a great degree of sterility, being destitute for the most part of wood and only scantily supplied with grass. This system of valleys and plains, inclosed by mountains, and sometimes connected with each other, constitutes a series of basins, each having a drainage of its own, but scarcely any of them having an outlet to the sea. To this mode of drainage Nevada, as well as many other parts of the great basin, is entitled for some of its peculiar topographical and geological features, the common receptacle of the gathered waters becoming, according to circumstances, a lake, a meadow, an alkali flat, or a salt-bed. The Humboldt, the longest and largest river in the state, is usually fordable in many places; and the Reese river, though having a length of nearly 150 m., is not over 10 or 15 ft. wide, nor has it an average depth of more than 2 feet. Like the other rivers of the state, these terminate in small lakes and pools. In respect to the approximate amount of land of the different qualities, the state surveyor's report for 1874 states that the agricultural land amounted in that year to 1,505,000 acres; grazing land, 22,210,276 acres; timbered land, 3,699,700 acres; and that the mineral lands already opened were 2,582,720 acres. The entire amount of mineral land is believed to exceed 6,000,000 acres; the amount of agricultural land is 17,608,960 acres; of reclaimable swamp-lands, 74,880 acres. The barren and worthless sandy lands amount to about 2,151,680 acres.

While the state will never be largely agricultural, it possesses, as will be noticed from the above estimate, an amount of arable land that will probably quite supply its own needs. Its great wealth is in its mines and mineral resources. Besides the precious metals, there have been found within its boundary lead, copper, iron, platinum, tin, zinc, antimony, nickel, cobalt, and arsenic; beds of pure sulphur, gypsum, rock salt, nitrate of potassa, carbonate of soda in large quantities, borax, lignite or brown coal, kaolin, etc. Gold and silver are commonly found associated with each other, gold predominating in the Antelope, Tuscarora, Gold mountain, Sacramento, and Sierra districts. Silver, however, is the staple mineral product, and the yield of this metal is constantly increasing. The Comstock lode, discovered in 1859, equals perhaps in value any deposit of the precious metals ever encountered in the history of mining enterprise. It is situated in Story co., about 25 m. from the western border of the state, on the eastern side of mount Davidson, and partly under Virginia City and Gold Hill. It has been traced on the surface 27,000 ft., explored 19,000 ft., and opened to a depth of 2,000 feet. Its ores contain about one-third in value of gold and two-thirds in silver. Other silver lodes are found in nearly every part of the state, some yielding from $65 to $100 to the ton, others from $400 to $2,000 or more to the ton. In 1874 there were 243 mines in 12 counties; and the yield of both gold and silver amounted to $35,402,263.

The interest manifested in agriculture and stock-raising throughout Nevada has greatly increased during the past six years. In agricultural industry in 1874 the surveyor-general's report shows that there were 77,564 acres of land under cultivation, and that there were raised, among other products, 73,600 bushels of wheat; 506,790 bushels of barley; 74,695 of oats; 1000 of rye; 13,960 of Indian corn; and 298,108 of potatoes. The live stock consisted of 22,131 horses; 4,732 mules and asses; 49,895 milch cows; 28,005 calves; 75,582 beef cattle; 185,486 sheep; and 5,290 hogs. The census of 1870 shows the number of manufacturing establishments to have been at that period 330, which employed 2,859 hands and had a capital invested of $5,127,790. Their annual product amounted to $15,870,539, divided as follows: milled quartz, $12,119,719; pig lead, $894,600; iron castings, $641,250; machinery, $273,500; lumber, $447,500; gold and silver reduced and refined, $260,000. The number of railroads in the state in Jan., 1875, was 14, and their entire mileage, 603.06 miles. The chief among these were the Central Pacific, which crosses Nevada from e. to w., connecting with San Francisco and the Union Pacific railroad; the Virginia and Truckee, from Reno on the Central Pacific to Virginia; and the Eureka and Palisade railroad, from Palisade on the Central Pacific to Eureka. On Jan. 1, 1875, the state debt was $660,000, and the assets applicable to its reduction, exclusive of the school fund, were $471,835.67. There was a balance in the treasury of $517,639.39. The assessed valuation of real and personal property for 1874 was $26,330,279.22.

In educational institutions Nevada is not old enough yet to have made much progress. Its school fund in 1875 amounted to $250,000, and during the previous year there were expended for school purposes $154,812.43. About 4,000 children were enrolled, though not more than half that number were in attendance. A state university was established at Elko in 1874, and opened its preparatory department with 12 pupils. Of the religious denominations represented in the state there were, in 1875, 5 Protestant Episcopal churches, 11 Methodist, 5 Presbyterian, 10 Roman Catholic, and 10 Mormon, having 19 church edifices, and owning property valued at $212,000, The number of newspapers published in the state in 1879 was 12.

The constitution of Nevada provides that every male citizen who has attained the age of 21 years, and who is neither insane, an idiot, nor an unpardoned felon, shall be entitled to vote. General elections occur on the Tuesdays next after the first Monday of November of even years. The state is entitled to two representatives in the U. S. senate and one in the house of representatives, and consequently to three electoral votes. The following is the state's electoral record: 1864, Abraham Lincoln, 3; 1868, Ulysses S. Grant, 3; 1872, Ulysses S. Grant, 3; 1876, Rutherford B. Hayes, 3; 1880, James A. Garfield, 3.

NEVADA, a co. in s.w. Arkansas, bounded on the n. and n.e. by the Little Missouri river, and drained by Terre Rouge creek and Cypress bayou; about 600 sq.m.; pop. '80. 12,959—3,732 colored. The surface is diversified and heavily wooded, and the soil in the valleys fertile. The principal productions are cotton and Indian corn. It was set off from Ouachita and Columbia counties. It is on the St. Louis, Iron Mountain, and Southern railroads. Co. seat, Prescott.

NEVADA, a co. in n.e. California, adjoining Nevada, bounded on the n.w. by the Middle Yuba river, drained by Bear creek and the South Yuba river, and crossed by the Central Pacific railroad; 1,050 sq.m.; pop. '70, 19,134—10,479 of American birth. The surface is irregular and mountainous, particularly in the e. portions, which are traversed by the Sierra Nevada. There are immense forests of evergreen trees. The soil in the river valleys and on the plains is fertile. The county contains Donner lake, a summer resort, and the mountain scenery in the e. is much admired. The principal agricultural productions are potatoes, butter, wine, and hay. There are breweries, flouring and saw mills, metal-ware manufactories, and machine-shops. But agriculture is little followed, the chief industry being gold mining. About one-half of the area contains valuable mineral deposits. Some of the richest veins of quartz in the state are found here, and there is a large number of mines, placer, hydraulic, and quartz. The placer mining is especially valuable. Limestone and granite abound. Large quantities of timber are exported. Co. seat, Nevada City.

NEVADA CITY, a t. in n. California, the terminus of the Nevada County narrow gauge railroad from this point to Colfax, connecting there with the Central Pacific; pop. '70, 3,986. It is the co. seat of Nevada co., in the midst of a mountainous region containing valuable gold mines, supplying 6 quartz mills. It is on Deer creek, 5 m. n.e. of Grass Valley, 33 m. e. of Marysville, and 65 m. n.e. of Sacramento. Its climate is considered very healthy, especially for consumptives, and its natural scenery attracts many visitors. It has 5 churches and several hotels, and is well built, mostly of brick. It has one newspaper, good public schools, a court-house, a bank, a masonic hall and places of meeting for all the secret orders, and an iron-foundry. The principal occupation is the cultivation of fruit and vines, and considerable wine is made.

NEVERS, a t. of France, capital of the department of Nièvre, and formerly the capital of the province of Nivernais, is built on a hill in the midst of fertile plains, at the confluence of the Loire and the Nièvre, 140 m. s.s.e. of Paris. Highly picturesque, as seen from a distance, its interior shows steep, winding, and badly-paved streets. It contains a beautiful cathedral of the 10th c., and a fine public garden; the large cavalry barrack, the fine bridge of 20 arches over the Loire, and the triumphal arch, erected in 1746, to commemorate the battle of Fontenoy, are also worthy of mention. Nevers is the see of a bishop, contains a public library, and has numerous educational, scientific, and benevolent institutions, and an arsenal. There is here an important cannon-foundry, and the principal manufactures are porcelain and earthenware, glass, brandy, iron cables and chains, and anvils. Pop. '76, 20,601.

Nevers, the *Noviodunum* of the Romans, existed prior to the invasion of Gaul by Julius Cæsar. It has been the seat of a bishop since the beginning of the 6th c., when it was called Nevirnum, became a co. in the 10th c., and was erected into a duchy by Francis I. in 1538.

NEVIANSK', a t. of Russia, in the government of Perm, 50 m. n. from Ekaterinburg. It is on the eastern or Siberian side of the Ural mountains, and stands on the Neiva, the waters of which flow by the Tobol and the Irtish to the Obi. The district around Neviansk is famous for its mineral wealth, particularly for its productiveness of gold, copper, and platinum. Neviansk has a mint, the tower of which is remarkable as leaning, even more than the celebrated tower of Pisa. Pop. 18,000.

NE'VILLE'S CROSS. See BRUCE, DAVID.

NEVIN, JOHN WILLIAMSON, D.D., LL.D., b. Penn., 1803; graduated at Union college 1821; studied in the theological seminary at Princeton, and remained there some time as an instructor, and wrote *Biblical Antiquities* (2 vols). In 1829-39 he was professor of Hebrew and Biblical literature in the Presbyterian theological seminary at Allegheny City; in 1840 became professor of theology and president of the German Reformed theological seminary at Mercersburg, Penn., and also, 1841, president of Marshall college at the same place; in 1843 published *The Anxious Bench*, which produced much discussion on the subject of revivals; in 1844 translated Dr. Schaff's inaugural address, *The Principle of Protestantism*, which was viewed as containing the germ of what was afterward called "Mercersburg theology" (q.v.), and was followed by *The Mystical Presence; History and Genius of the Heidelberg Catechism*, and *Anti-Christ, or the Spirit of Sect and Schism*. Dr. Nevin also edited the *Mercersburg Review*, 1849-53; in 1851 he resigned the presidency of the seminary, and, in 1853, of the college, on its removal to Lancaster to be consolidated with Franklin college. He was afterward chosen president of Franklin and Marshall college, and still holds the position.

NE'VIS, a small island of the West Indies, belonging to Great Britain, forms one of the group of the Lesser Antillies, and lies immediately s.e. of St. Christopher's, from which it is separated by a strait, called the *Narrows*, two m. wide. It is circular in form, rises in a central peak to the height of about 2500 ft., and has an area of 20 sq.m. Pop. '71, 11,735, of whom very few are white. Charlestown, a seaport, with a tolerable roadstead, situated on the s.w. shore of the island, is the seat of government, consisting of a government council and general assembly. The soil is fertile, and the principal products are sugar, molasses, and rum. In 1875 the revenue of Nevis was £10,001; and the expenditure £9,526. The imports for 1873 were valued at £52,293; and the exports at £83,225. The value of the sugar exported was £72,342, more than double the value of the year before, but only about £6,000 more than in 1871. The tonnage of vessels entering and clearing in 1873 amounted to 24,429.

NEW, JOHN C., b. Ind., 1831, educated at Bethany college, West Virginia; a graduate of the class of '53; studied law, but turned his attention to politics and never became a practitioner. He has served his native state in the capacity of state senator, and filled the office of adjt.gen. of Indiana; was cashier of the first national bank of Indiana, and in 1875 was appointed U. S. treasurer under president Grant. In 1879-80 he was chairman of the Indiana republican committee.

NEW ALBANY, a city in Indiana, United States, on the n. bank of the Ohio river, at the foot of the falls, opposite Portland, and 2 m. below Louisville, Ky.; a finely-situated, well-built town, having 22 miles of streets, 6 ship-yards, 6 foundries, 30 churches, and is the site of Asbury college and a collegiate institute. It has a large river-trade and railway connections with Indiana and Kentucky. Pop. '70, 15,396; '74, 22,246.

NEW ALBANY (*ante*), the co. seat of Floyd co., on the Louisville, New Albany, and Chicago railroad; pop. '80, 16,422. It has manufactories of cars, engines, and boilers; rolling, planing, and flour mills, iron foundries, etc. It has 1 daily and 2 weekly newspapers.

NEW'ARK, a municipal and parliamentary borough of England, in the co. of Notts, on the Great Northern and Midland railways, and on a navigable branch of the river Trent, 16 m. s.w. of Lincoln. The parish church, a large and elegant edifice, though often rebuilt, still shows traces of its original Norman character. Newark is approached from the n. by a causeway a mile and a half long, carried over the flat island formed by the Trent on the w. and the Newark branch on the east. The castle of Newark, in which king John died in 1216, was built early in the 12th century. Newark is said to be the greatest malting town in England; there are flour-mills, breweries, and trade in corn, malt, flour, cattle, wool, and coal. A corn exchange has been recently erected. Newark returns two members to parliament. Pop. '71, 12,218.

NEW'ARK, a city and port of entry of New Jersey, United States, on the w. bank of the Passaic river, 12 m. from New York, on the New Jersey railway. It is a handsome and industrious city; its principal street is 2 m. long, 120 ft. wide, shaded by great elms, and bordering on three public parks. It contains a custom-house and post-office, 95 churches, numerous public schools, 11 banks, 17 newspapers, and extensive manufactories of leather, patent leather, enameled cloth, carriages, saddles and harness, boots and shoes, clothing, hats, jewelry—1015 establishments producing annually $75,000,000. It was settled in 1666 by a Puritan colony from Connecticut. Newark has 140 vessels of 12,000 tons. Pop. in '70, 105,059.

NEWARK, a city of Essex co., New Jersey, a port of entry and capital of the co.; pop. '80, 136,400, being an increase of 30 per cent since 1870. It is situated on an elevated plain on the right bank of the Passaic river, 9 m. from New York city, and 4 m. from Newark bay. Its history is somewhat peculiar. In 1665 the colonies of Hartford and New Haven, Conn., being united in spite of the opposition of the people of Branford, the latter deserted that part of the country in a body, headed by their pastor, and taking with them their families and household goods. They bought the land on which Newark now stands, from the Hackensack Indians, for £130, 12 blankets, and 12 guns, and there founded their city, laying it out in broad streets. No one was permitted to hold office, to vote, or was a freeman, who did not have membership in the Congregational church; in 1676 the church building was fortified against attacks by the Indians. In 1682 Newark was famous for the manufacture of cider. In 1745–46 the English grantees of East Jersey undertook to invalidate the titles of the Puritans to their lands, whereupon rioting occurred, which was suppressed with difficulty. The college of New Jersey was in Newark from 1747 to '55, and here was founded the Newark academy in 1792. In 1777 the town was occupied by the British, when it was sacked and plundered, and nearly destroyed. The population was 1000 in 1780; 10,950 in 1830; 17,290 in 1840; 71,041 in 1860. Newark contains 104 churches, an academy, high-school, and 25 public schools; 11 banks, 9 horse-railroads, a paid fire department, and a fire-alarm telegraph. Among its public buildings are the city-hall, court-house, and custom-house and post-office. Literary associations are the library association and the state historical society. Newark is a leading manufacturing city, particularly in jewelry, India-rubber goods, carriages, paper, leather, and machinery. The Passaic flour-mills produce 2000 barrels of flour daily, and a spool-thread company employs 750 girls in its manufactory. The life insurance companies of Newark have $30,000,000 capital, and the fire insurance companies, $6,000,000. There are large shipping interests, and the docks extend a m. in length. The streets in the city cover 150 m. in length, and there are 40 m. of sewers. A short distance from Newark are brown-stone quarries which supply great quantities of building material for New York.

NEWARK, a city in Ohio, capital of Licking co.; situated at the union of three branches of the Licking river; pop. '70, 6,698. It is on the Ohio canal, and the Baltimore and Ohio, and Pittsburg, Cincinnati, and St. Louis railroads. It is built on an extended plain, surrounded by a fertile and productive country. and is laid out attractively, with broad streets. It has a graded public school system. In the neighborhood are sandstone quarries, a coal mine, and petroleum refineries.

NEWAY'GO, a co. in w. Michigan, intersected in the s. by the Grand Rapids, Newaygo and Lake Shore railroad, one division terminating at Everett, and another, from Big Rapids to Muskegon, crossing it centrally; 864 sq.m.; pop. '80, 14,688—11,902 of American birth, 146 colored. Its surface is generally level, largely covered with forests of hard wood and sugar maple. It is drained by the head-waters of the Muskegon, Marquette, and White rivers. Its soil is fertile and adapted to the production of wheat, rye, corn, oats, potatoes, wool, dairy products, and maple sugar. Its rivers furnish valuable water-power, and it has manufactories of lumber, sashes, and shingles. Much attention is paid to stock raising. Co. seat, Newaygo Court-House.

NEW BEDFORD, a seaport city of Massachusetts, on Buzzard's bay, 55 m. s. of Boston. Since 1755 it has been the chief center of the American whale fisheries. The value of this industry has been for many years on the decline. The trade was at its height in 1853–54, when there were in the district 410 whalers of 132,966 tons, which brought home 44,923 bbls. of sperm oil, 118,672 bbls. of whale oil, and 2,838,800 lbs. of whalebone. In 1873 New Bedford possessed 128 whalers, which brought home 39,961 bbls. of sperm oil, 25,729 bbls. of whale oil, and 150,598 lbs. of whalebone. It has oil and candle factories, cotton mills, iron mills, copper and glass works, 30 churches, 6 banks, 2 daily and 2 weekly newspapers, a public library of 30,000 volumes, city hall, custom-house, and alms-house. Pop. '70, 21,320.

NEW BEDFORD (*ante*), a city in e. Massachusetts, set off from Dartmouth, 1787, incorporated 1847, on the w. bank of Acushnet river, near its mouth; pop. '80, 26,875. It is one of the capitals of Bristol co., and has become a manufacturing city of considerable importance. Besides its reciprocal trade with other ports, it is a shipping place for coal consigned to the south. It is connected with Boston by two railroad routes owned by the Old Colony railroad, the road across the river affording a route to cape Cod, through Fairhaven, and the other, through Taunton direct, to Boston. Propellers run from this port to New York, and steamers to Martha's Vineyard. It has public schools, a high-school building erected at a cost of $126,000, an academy under the direction of the society of Friends, and 27 churches. The public library was opened to the public by the city in 1852, and was one of the first free public libraries in the United States. In 1857 it was placed in a commodious and convenient building, costing $45,000. A fund of $100,000 was bequeathed to the city by the late Sylvia A. Howland for the promotion of liberal education, and for the introduction of water into the city. Among its institutions is the union for good works, a worthy charity accomplishing much toward the relief of the suffering poor. It also contains St. Joseph's hospital (Catholic), an orphan asylum, a well-organized fire department with 5 steam fire-engines, an electric fire-alarm telegraph, and a horse railroad constructed in 1872. It is well supplied with water from Acushnet pond, the works having been erected in 1867-69 at a cost of $1,000,000, the reservoir having a capacity of 400,000,000 gallons. The water is carried 6 m. and raised 100 feet. It is lighted by gas. Among its industries are the manufacture of Prussian blue, paraffine candles, cordage, shoes, etc., and it has oil and paint works, two manufacturing photographic establishments, and tanneries. It contains seven banks, five of them national, fire and marine insurance companies, daily and weekly newspapers, and a weekly shipping list. The Clarke's Cove fertilizing company has been lately established, its buildings covering 40,000 sq.ft. of land. Among some of the more recently built factories are the Wamsutta mills, making superior cotton cloth, and having a capital of $2,500,000; the Potomska mills, making print cloths, with a capital of $900,000; the Morse twist drill factory; and the Gosnold iron mill, named in honor of Bartholomew Gosnold, an English mariner, who attempted to colonize New England in 1602, and named cape Cod. It is 11 m. in length and 2 m. in width, and is regularly laid out, with streets at right angles, shaded by maples and ancient elms that, on some streets, almost meet and form an arch over the wide thoroughfares. The land slopes toward the water, and the elevated portion offers fine sites for the erection of the elegant private residences for which the city is noted. The river is crossed by a bridge 4,000 ft. long connecting the city with Fairhaven. It has an elegant drive 4¼ m. in extent around Clarke's point, commanding an unobstructed view of the harbor and far out to sea. A granite fort, situated on the extremity of the point, commands the entrance to the harbor, which is convenient and easily approached. Its valuation is larger than any other city of its size in the United States in proportion to its population. In 1877 the valuation for real estate was $12,609,200; personal, $10,854,900.

NEW BERNE, a city and port of entry of North Carolina, on the s. bank of the Neuse river, at its confluence with the Trent, 30 m. from its mouth in Pamlico sound. It exports tar, turpentine, naval stores, flour, and lumber. Pop. '70, 5,849.

NEW BERNE (*ante*) is the port of entry of Pamlico district, 40 m. from the mouth of the Neuse river, on the Atlantic and North Carolina railroad. It has a considerable commerce, having direct communication with the sea by way of Ocracoke inlet. Its chief trade is coastwise, in fish, cotton, lumber, and naval stores. Its manufactures include agricultural implements, carriages, etc., and it has turpentine distilleries, grist and saw mills, foundries, and machine shops. In 1862, during the rebellion, gen. Burnside was sent to New Berne at the head of an important expedition, designed to weaken the enemy by interfering with their base of supplies, and by the occupation of a point at which a threatening attitude could be constantly maintained: it was entirely successful; and on Mar. 14 the city was captured after a severe engagement, being well defended by strong intrenchments. Sixty-nine cannon and a large quantity of ammunition were taken, and the city was seriously damaged.

NEWBERRY, a co. in central South Carolina, having the Saluda river for its s. boundary, the Ennowee and Tiger rivers for its n., and the Broad river for its e. boundary; 700 sq.m.; pop. '80, 26,497—26,383 of American birth, 18,262 colored. It is intersected by the Greenville and Columbia railroad, and the Laurens railroad terminates at Newberry. Its surface is undulating, in some portions rising into considerable elevations, and timber is abundant. It has extensive granite ledges, and the soil is fertile, especially the alluvial soil near the rivers. Cattle, sheep, and swine are raised; and wheat, corn, oats, sweet potatoes, and cotton are the chief products. It has steam saw-mills and a few manufactories. Co. seat, Newberry Court-House, an important cotton mart.

NEWBERRY, JOHN STRONG, M.D., LL.D.; b. Conn., 1822. In 1824 his father emigrated with his family to Ohio, and founded the town of Cuyahoga Falls. Newberry graduated from Western Reserve college in 1846, and from the Cleveland medical college in 1848. After two years of study and travel abroad he settled down to the practice of medicine in Cleveland, but his growing fondness for natural science led him to accept the appointment of assistant surgeon and geologist on lieut. Williamson's survey of northern California and Oregon in 1855. Newberry's researches were published in a separate quarto volume, as well as in the Pacific railroad reports. In 1857-58 he accompanied lieut. J. C. Ives's expedition to the Colorado river, taking out an iron steamer in sections and navigating that stream for 500 miles. Newberry's portion of the report was acknowledged by his commander to constitute "the most interesting material gathered by the expedition." He assisted, in 1859, capt. Macomb's exploration of the upper Colorado and San Juan rivers, opening up an interesting region of immense mineral resources, and published a report on it. During the rebellion his administrative capacity was demonstrated by his superintendence, as secretary, of the affairs of the sanitary commission throughout the Mississippi valley In 1866 he was appointed to, and still continues to hold, the professorship of geology and paleontology in the school of mines of Columbia college. He has been state geologist of Ohio since 1869, and completed an exhaustive geological survey of the state within five years, the final reports of which, now in process of publication, will make eight volumes, besides a map. Prof. Newberry has made many contributions to the literature of fossil fishes and plants, and geology in general. He is a member of numerous American and European scientific societies, and is now president of the New York academy of sciences.

NEW BRIGHTON, a village in s. New York, on the n.e. shore of Staten island, in the s. portion of New York harbor, 6 m. s.w. of the city. Pop. '70, 7,495. It is in Castleton township in the county of Richmond, and contains the post-office of West New Brighton. It is connected with the metropolis by steam ferries, and has many elegant villas occupied by persons engaged in business who make the trip daily. It is the seat of "Sailors' Snug Harbor," a hospital or home for mariners who are past their usefulness, and also for the destitute sick or infirm families of seamen. It has 9 churches and a number of fine hotels. Its situation is on an elevation which commands a magnificent view of the bay, and granite is found in the immediate neighborhood. Its manufacturing establishments are a paper-hanging factory, silk-printing works, a fancy dyeing establishment, and dyeing and printing works, which are very extensive.

NEW BRIGHTON, a borough in w. Pennsylvania, on the Pittsburg, Fort Wayne and Chicago railroad; pop. '70, 4,037. It is on the e. bank of the Beaver river, which furnishes very extensive and valuable water-power, and is 28 m. n.w. of Pittsburg, and 21 m. s. of New Castle. The Beaver river empties into the Ohio 3 m. below. It has 10 churches, 3 banks, one of which is national, a public library, a newspaper, and excellent schools. It is connected with the town of Beaver Falls by a bridge across the river. It is in a coal region, and is connected with lake Erie by the Beaver and Erie canal. Its manufactures are important; among its industries may be numbered the manufacture of chairs, woolen goods, twine, nails, pottery, lead-kegs, coffee-mills, rivets, wire, etc. It has a variety of stores and an extensive greenhouse.

NEW BRITAIN, a manufacturing t. in Connecticut, 10 m. s. of Hartford, engaged in the production of stockinet goods, locks, jewelry, hooks and eyes, and various kinds of hardware. It has six churches. The water supply is from a reservoir of 175 acres, with a head of 200 feet, supplying public fountains with jets of 140 feet, and dispensing with fire-engines. Pop. '70, 9,480.

NEW BRITAIN, the name of one principal and of several subsidiary islands in the Pacific ocean, in lat. between 4° and 6° s., and long. between 148° and 152° 30'e. The principal island, 300 m. in length, and having an area of 12,000 sq.m., lies e. of New Guinea, from which it is separated by Dampier's straits. The surface is mountainous in the interior, with active volcanoes in the north, but along the coast are fertile plains. Forests abound in the island, and palms, sugar-cane, bread-fruit, etc., are produced. The inhabitants, the number of whom is unknown, are described as a tribe of "oriental negroes," and are well-formed, active, and of a very dark complexion. They are further advanced in civilization than is usual among the Polynesians, have a formal religious worship, temples, and images of their deities. New Britain was first seen by Le Maire and Schouten in 1616, but Dampier, at a later date, was the first to land.

NEW BRUNSWICK, a city of New Jersey, is on the s, bank of the Raritan river, at the head of navigation, 15 m. from its mouth, 30 m. s.w. of New York, on the New Jersey railway, and the Delaware and Raritan canal. It has extensive manufactures of cotton, leather, india rubber, paper-hangings, iron, and machinery, 17 churches, 2 banks, and 4 newspapers. It is the seat of Rutger's college and a theological seminary. Pop. '60, 11,255; '70, 15,058.

NEW BRUNSWICK, a province of the Dominion of Canada, is bounded on the n.w. by Canada and the bay of Chaleur, on the n.e. by the gulf of St. Lawrence and the strait of Northumberland, on the s. by Nova Scotia and the bay of Fundy, and on the s.w. by the state of Maine. It has an area of 27,710 sq.m., or 17,734,400 acres (rather more than the area of Scotland), and a population, in 1871, of 285,594. The coast line is 500 m. in extent, and is indented by spacious bays, inlets, and harbors, which afford safe and commodious anchorage for shipping. The chief are Fundy, Chignecto, and Cumberland bays, the last two being merely extensions of the first; Passamaquoddy bay in the s.; Verte, Shediac, Cocaigne, Richibucto, and Miramichi bays on the n.e.; and the bay of Chaleur, 80 m. long by 27 broad, in the n.w.. The province of New Brunswick abounds in rivers. The principal are the St. John and the St. Croix, the former 450, and the latter 100 m. in length, and both falling into the bay of Fundy; and of the rivers that flow eastward into the gulf of St. Lawrence, the Richibucto, the Miramichi, and the Restigouche. The province contains numerous lakes, one of which, Grand lake, is 100 sq.m. in area. Most of the others are much smaller. The surface is for the most part flat or undulating. With the exception of the district in the n.w. bordering on

Canada and the river Restigouche, no portion of New Brunswick is marked by any considerable elevation. Here, however, the country is beautifully diversified by hills of 500 to 800 ft. in height. These elevations, which form an extension of the Appalachian range, are interspersed with fertile valleys and table-lands, and are clothed almost to their summits with lofty forest-trees. In this district the scenery is remarkably beautiful. In the s. of the colony the surface is broken up by great ravines, and the coast is bold and rocky. The shores on the e. coast, and for 20 m. inland, are flat. The soil is deep and fertile. Of the whole acreage, 14,000,000 acres are set down as good land, and 3,600,000 acres as poor land. New Brunswick contains a rich and extensive wheat-producing district; but the inhabitants, dividing their time between farming, lumbering, fishing, ship-building, and other pursuits, and following no regular system of tillage, have not till quite recently attempted to keep pace with modern agricultural improvements. The farming has not been judicious; many parts of the country have been allowed to become exhausted; and, although signs of improvement begin to be manifest, still there is prevalent a deplorable lack of knowledge of the principles of scientific agriculture. Several cheese factories have been established in the province within the last few years. In one year one of these has manufactured as much as 25,000 lbs. The crown lands are at present being disposed of under the act 31 Vict. cap. 7, 1868. This act provides that certain portions of eligible land shall be reserved for actual settlers, and not be disposed of to speculators, or for lumbering purposes. A male of 18 years of age or upwards may obtain 100 acres, either by payment, in advance, of $20 (£4 8s.), to aid in the construction of roads and bridges in the vicinity of his location, or upon his performing labor on such roads and bridges, to the value of $10 a year, for three years. He must also, within two years, build a house on his land of not less dimensions than 16 ft. by 20, and clear two acres. After a residence for three years in succession he receives a deed of grant if he has paid the $20 in advance or cultivated ten acres. The receipt of the crown-lands department of the provincial government for the year ending Oct. 31, 1868, amounted in value to $3,893,109. During 1870 no less than 925 grants of land were issued. The climate is remarkably healthy, and the autumn—and especially the season called the Indian summer—is particularly agreeable. In the interior the heat in summer rises to 80°, and sometimes to 95°; and in winter, which lasts from the middle of December to the middle of March, the mercury sometimes falls as low as 40° below zero. At Fredericton, the capital, situated on St. John river, 65 m. from the s. and 130 m. from the n. coast, the temperature ranges from 35° below to 95° above zero, and the mean is about 42°.

The north-western portion of the province is occupied by the upper Silurian formation. Next are two belts of lower Silurian. Small patches of the Devonian, Huronian, and Laurentian systems are found on the bay of Fundy. A large part of the province is occupied by carboniferous strata. The mineral coal is for the most part impure or in thin seams, and is hardly worked; but the so-called Albertite of Albert county is the most valuable of bituminous matter on the American continent. It yields 100 gal. of crude oil per ton. Salt springs are numerous. Copper and iron ore are found, as also antimony and manganese; gypsum, plumbago, and limes tone are very abundant, and the freestone of the province, unsurpassed for beauty and durability, commands a high price in the states. Wild animals abound in the province; the lakes and rivers are well stocked with fish, and along the coasts, cod, haddocks, salmon, and other fish are caught in great plenty. The number of schools in New Brunswick during the winter of 1869 was 828, in which 29,754 pupils were enrolled. The value of the imports for 1873–4 was $10,223,871; of exports, $6,504,394. The number of vessels entering the ports was 2,784, of 775,638 tons; clearing, 2,662, of 799,265 tons. The number of men employed in the fisheries was 6,656; number of vessels, 131, of 2,518 tons; number of boats, 3,351; value of catch, $2,685,795. In 1871 the total value of manufactured products was $17,367,687. In 1874 there were in operation 455 m. of railway. Around the coasts and along the banks of the rivers there are excellent public and coach roads. Chief towns, the city of St. John and Fredericton, the political capital.

The province of New Brunswick, together with that of Nova Scotia, originally formed one French colony, called Acadia, or New France. It was ceded to the English in 1713, and was first settled by British colonists in 1764. In 1784 it was separated from Nova Scotia, and erected into an independent colony. It joined the Dominion of Canada in 1867.

NEW'BURG, a village of New York, on the w. bank of the Hudson, 61 m. n. of New York, amid the grand scenery of the highlands. Its handsome edifices, villas, and gardens, on a gentle slope from the river, command a noble prospect. It contains a court-house, 5 foundries, a cotton factory, breweries, a railway carriage manufactory, 2 pianoforte manufactories, steam-boiler works, 5 soap factories, 41,000 tons of shipping, a large lumber trade, 23 churches, 5 banks, schools, and academies. It was Washington's headquarters during a critical portion of the war of independence. Pop., '70, 17,014.

NEWBURG (*ante*), situated on a steep slope of the Hudson river, has its water-front lined with warehouses, and enjoys a considerable commerce; pop., '80, 18,050. The locality was seen by Hudson in 1609, who wrote of it: "It is as beautiful a land as one can tread upon; a very pleasant place to build a town on." It was occupied at that time, and for some years later, by a portion of the Delaware tribe of Indians, who were defeated by the Dutch in the war of 1658–60, and driven away in 1663. In 1709 it was settled by German Lutherans from the Palatinate of the Rhine, who called it "The Palatine Parish of Quassaic." In 1752, the Germans having been displaced, its name was changed to "The Parish of Newburg," from its resemblance to Newburgh on the river Tay in Scotland. It was the headquarters of gen. Washington in 1782–83; and the house which he occupied, in the s. part of the city, is now the property of the state, and is preserved as a historical relic, containing a museum of revolutionary curiosities, open to the public. Here the continental army was disbanded, and it was from this place that the celebrated "Newburg letters" emanated, containing a treasonable suggestion to create Washington "king of America," considered so important that Washington convened the officers of the army in a public building in the city, and addressed them in earnest remonstrance—a course which at once destroyed any possible influence of the letters in question. Newburg is an important coal market, and has some manufactures. It has 23 churches, a public school system, and a water-supply with expensive works. The Newburg and New York railroad connects with the Erie railroad at Turner's. On a height overlooking the city is the theological seminary of the United Presbyterian church. Steamboats connect the city with New York.

NEWBURY, a municipal borough and market t. of Berkshire, England, on both banks of the Kennet, 17 m. w.s.w. of Reading. The church, a specimen of the perpendicular style, was built in the reign of Henry VII.; but the tower was built by John Winchcombe, a clothier and famous citizen of Newbury in the reign of Henry VIII. Since 1862 an annual wool-market has been held here. In 1862 a new corn exchange was built. Newbury is the best known for two hard-fought battles between the royalists and parliamentarian forces which took place—the first in September, 1643, the second in October, 1644. In the former, victory was undecided; in the latter the advantage was on the side of the parliamentarians. Pop., '71, 6,602.

NEWBURYPORT, a city and port of entry of Massachusetts, on the s. bank of the Merrimac river, 3 m. from its mouth, 34 m. n.e. of Boston. Lat. 42° 48' 30" n., long. 70° 52' 3" w. It is a pretty town, built on a swell of land rising 100 ft. from the river. High st., 3 m. long, shaded with trees, a beautiful mall, and pond of six acres, are its chief ornaments. It has 16 churches, in one of which is the tomb of Whitefield, who died here (1770), 4 banks, 4 manufacturing companies, making 16,000,000 yards of cloth annually, several ship-yards, and manufactories of machinery, hats, clothing, etc.; 2 daily papers, one of which was established in 1792; a free high school, and a free library of 10,000 volumes. Pop., '70, 12,595.

NEWBURYPORT (*ante*), in Essex co., Mass., on the Eastern railroad. It was settled about 1635, and has always been prominent among the towns and cities of the state. During the revolution and in the war of 1812 its citizens were distinguished for their patriotic spirit, and the first privateers fitted out were from this port. In 1851 it received the charter of a city, and since then its population has increased about 4,000. Besides other institutions, the city contains a court-house, a granite custom-house, a city hall, and a marine museum. Ship-building is a prominent business. In 1854 the aggregate tonnage of the vessels built was 20,000; in 1874, 15,000. Its national banks have an aggregate capital of $820,000; and the savings banks have deposits amounting to $5,300,000. The place, which was important for enterprise and wealth more than a c. ago, has an air of antiquity and established social conditions not usual in American cities.

NEW CALABAR RIVER. See CALABAR, *ante*.

NEW CALEDONIA, an island of the South Pacific ocean, belonging to France, and lying about 720 m. e.n.e. of the coast of Queensland, in Australia, in lat. 20°—22° 30' s., long. 164°—167° e. It is about 200 m. in length, 30 m. in breadth, and has a population estimated at 60,000. It is of volcanic origin, is traversed in the direction of its length, from n.w, to s.e., by a range of mountains, which in some cases reach the height of about 8,000 ft., and is surrounded by sand-banks and coral-reefs. There are secure harbors at port Balade and port St. Vincent, the former on the n.e., the latter on the s.w. part of the island. In the valleys the soil is fruitful, producing the cocoa-nut, banana, mango, breadfruit, etc. The sugar-cane is cultivated, and the vine grows wild. The coasts support considerable tracts of forest, but the mountains are barren. The inhabitants, who resemble the Papuan race, consist of different tribes, some of which are canibals. New Caledonia was discovered by capt. Cook in 1774. In 1853 the French took possession of it, and it has since 1872 been used by the French authorities as a penal settlement. Mission stations have been established. In 1878, some of the natives rose in insurrection and massacred a number of the white residents.

NEW CASTLE, a co. in n. Delaware, having the Delaware river for its e. boundary, the state line of Pennsylvania for its n. and n.w., bounded by the state of Maryland on the w.; 500 sq.m.; pop., '80, 77,746—69,028 of American birth, 12,649 colored. It is intersected by the Philadelphia, Wilmington and Baltimore railroad, the Wilmington and Reading, and the Delaware railroads. It is drained by the Brandywine and Christiana rivers, and Red Clay and Duck creeks, emptying into the Delaware. Its surface is broken, rising into hills in the w. portion, furnishing good pasturage. Its soil is exceptionally fertile, and adapted to the production of grain, dairy products, and fruit, especially peaches; honey and sorghum are among the products. The rivers furnish extensive water-power. Its leading industries are the manufacture of flour, carriages, metallic wares, iron, woolen goods, ships, etc. Co. seat, New castle.

NEW CASTLE, a borough in w. Pennsylvania, on the Beaver and Erie canal, at the junction of the Erie and Pittsburg railroad, the New Castle and Beaver Valley, the New Castle and Franklin, and the Pittsburg and Lake Erie railroads; pop. '70, 6,164. It is the county seat of Lawrence co., on the Shenango river, at the mouth of Neshannock creek; 50 m. n.w. of Pittsburg. Coal, iron ore, and limestone are mined. Fire-clay is abundant, and it has manufactories of nails, window glass, flour, paper, etc. It has blast furnaces, rolling mills, foundries, grist and planing mills, and breweries. Manufacturing and mining are its principal industries. It is the seat of New Castle college, has excellent public schools in convenient buildings, 12 churches, 5 banks (2 national), and an institution for savings. It has good hotels, a fine opera-house, a variety of stores, and 4 weekly newspapers.

NEWCASTLE, Duke of, THOMAS PELHAM HOLLES, minister of the first two Georges, b. 1692, and representative of the noble family of the Pelhams, played a prominent, but by no means illustrious part in the political history of his time. While a very young man, he succeeded to the family peerage by the death of his father, lord Pelham, and George I. rewarded his attachment to the house of Brunswick by creating him first, earl of Clare, and afterwards duke of Newcastle. He was made secretary of state when but thirty years old, although the king declared that he was not fit to be chamberlain to the smallest court in Germany. There was much of the absurd and grotesque in his character. Macaulay says of him, that "his gait was a shuffling trot; his utterance a rapid stutter; he was always in a hurry; he was never in time; he abounded in fulsome caresses, and in hysterical tears." Yet this man was during thirty years secretary of state, and for near ten years first lord of the treasury! He served under sir R. Walpole, retained his secretaryship in the "broad-bottomed administration" in 1744, and in 1754 succeeded his brother, Mr. Pelham, as head of the government. In 1757 he was compelled to take the first William Pitt (afterwards earl of Chatham), into his ministry, and to give him the lead in the house of commons, and the supreme direction of the war and of foreign affairs. A succession of brilliant victories followed—Newcastle being only nominal head of the administration—and the great commoner had almost brought the war to a successful termination, when the accession of George III. led to the resignation of Mr. Pitt, and the replacement of Newcastle, in May, 1762, by lord Bute, as head of the ministry. Newcastle declined a proffered pension, with the remark that if he could no longer serve he would not burden his country. In the Rockingham ministry, formed in 1765, Newcastle filled the office of privy seal. He died Nov. 17, 1768. His title descended to Henry, ninth earl of Lincoln, whose great-grandson,

HENRY PELHAM-CLINTON, fifth duke of NEWCASTLE, and twelfth earl of Lincoln, was b. 1811, and educated at Christ-church, Oxford. He represented South Notts in parliament from 1832 to 1846, when he was ousted by the influence of his father, the fourth duke, for supporting sir R. Peel in his free-trade measures. He adopted politics as a profession; was a lord of the treasury in the brief conservative administration of 1834–35; and first commissioner of woods and forests in the Peel administration, from 1841 to 1846. He was then made chief secretary to the lord-lieut. of Ireland, but went out of office with his chief a few months afterwards. He succeeded to the dukedom in 1851, and returned to office in 1852, filling the post of secretary of state for the colonies (which formerly included the department of war) in the Aberdeen government. The war with Russia broke out, and in June, 1854, it was found necessary to create a secretary of state for war, and the new office was assigned to Newcastle. The "horrible and heart-rending" sufferings of the British army before Sebastopol in the winter months of 1854 raised a storm of popular discontent, and when the house of commons determined to inquire into the conduct of the war, the duke resigned. Yet, as is now acknowledged, no blame was attributable either to the minister for war or his subordinate, Mr. Sidney Herbert. They were called upon to administer a vicious system of military organization which broke down under the strain brought to bear upon it. Newcastle was reappointed colonial secretary in the second administration of lord Palmerston, and held the seals with general approval from 1859 to the year of his death, 1864. In 1860, as secretary of state for the colonies, he accompanied the youthful prince of Wales during a tour in Canada and a portion of the United States, and on his return received the order of the garter from the queen. He died Oct., 1864.

NEWCASTLE, MARGARET CAVENDISH, Duchess of. See CAVENDISH, MARGARET, *ante.*

NEWCASTLE, WILLIAM CAVENDISH, Duke of. See CAVENDISH, WILLIAM, *ante.*

NEWCASTLE-UNDER-LYME, a parliamentary and municipal borough of England, in the county of Stafford, 16 m. n.n.w. of the town of that name. A branch railway connects it with the North Staffordshire line, and a branch-canal with the Grand Trunk Navigation. One of its churches, rebuilt early in last century, has a very old square tower of red sandstone. The free grammar school has an income of about £100 a year, and was founded in 1602. Hats are the principal branch of manufacture, and silk, cotton, and paper mills are in operation. Newcastle-under-Lyme is surrounded by famous potteries, and coal-mines are worked in the vicinity. Pop. '71, 15,949.

NEWCASTLE-UPON-TYNE, the chief t. of Northumberland. Lat. 54° 58′ 11·6″ n., long. 1° 36′ 36·5″ west. It has the privileges of a county of itself. Gateshead, which stands upon the opposite side of the river, though in a different county and having a separate jurisdiction, is virtually a part of Newcastle. According to the census of 1871, Newcastle contained a pop. of 128,443, Gateshead, 48,627; making together 177,070 inhabitants. Newcastle sends two members to parliament.

The Romans had a stationary camp here, called Pons Ælii—one of the chain of forts by which the wall of Hadrian was fortified. On the withdrawal of the Romans, the deserted camp became the residence of a colony of monks, and the town was called Monkchester. Robert, eldest son of the conqueror, commenced to build a castle here in 1079 or 1080. Hence the modern name of New Castle. William Rufus built his brother's castle, surrounded the town with a wall, and gave the inhabitants peculiar privileges. The present castle, which displays better than any other in England the genius of Norman military architecture, was erected by Henry II. between the years 1172 and 1177. Newcastle being made the rendezvous of the vast armaments which the first three Edwards led into Scotland, it was in their time surrounded with new walls of unusual strength and magnitude; portions of them yet remain.

The town stands partly upon an elevated platform, and partly upon the n. bank of the river. The more ancient houses in the lower part of the town are chiefly built of timber; those in the center of the town are mostly of stone; but the houses generally are of brick. Chiefly through the instrumentality of one man of humble origin—Richard Grainger—Newcastle has in modern times received the addition of many elegant streets, squares, and public buildings. The river is crossed by three bridges—the High-level bridge, the Redheugh bridge, and a swing bridge (completed in 1874), one of the largest structures of the kind in the world. The High-level bridge forms one of the engineering triumphs of Robert Stephenson. It consists of six cast-iron arches, supported upon piers of masonry. The length of the viaduct is 1337 feet, and the height of the railway above high-water mark, 112. It has a broad carriage-way, by which the ordinary traffic avoids the precipitous streets on both sides of the river, with passenger path on each side, and the railway above. A quay, at which the depth of water at ebb-tide is 22 ft., has been constructed by the corporation, at a cost of over a quarter of a million, or at the rate of about £120 per lineal yard

There are 16 churches and chapels in the town connected with the Established church, and about 60 belonging to other classes of worshipers. The mother church (St. Nicholas) is a noble edifice, chiefly in the decorated style; its steeple, which is singularly light and bold, is early perpendicular. In the Guild hall, an old and somewhat inconvenient building, situated beside the river, the town assizes are opened, and the quarter sessions held. Under the Guild hall proper there is an exchange for the merchants, ship-owners, and brokers of the quay-side. In the Moot hall, a modern and very handsome Grecian building overlooking the swing-bridge, the town and county assizes are held. A new and very spacious town-hall was built about twenty years ago on a block of ground facing St. Nicholas's church; associated with it are a corn market and offices for the transaction of the town business. The market for the sale of butcher-meat and vegetables is probably the most spacious and commodious in the kingdom. All the railways entering the town terminate in a large station near its center. The jail, a heavy and costly mass of building, occupies a low and confined situation. The central police station, police court, and offices, built in 1873, are comprised in a large and handsome structure in Pilgrim street. The new postal and telegraph office, begun in 1873, is one of the largest and finest of the public buildings in the town. There are two theaters—the Royal (the great ornament of Grey street, the handsomest street in the town), and the Tyne theater in Westgate street. Newcastle has two monuments—a column surmounted by a statue of earl Grey, to commemorate the passing of the reform bill, and a bronze statue to George Stephenson.

The corn market is held on Tuesday and Saturday; the hay market and the cattle market on Tuesday. During the year 1873, 81,635 fat cattle, 350,638 sheep and lambs, and 39,585 swine were brought to the cattle market. A very large market is held every Thursday morning for the sale of butter, bacon, cheese, eggs, and other articles of country produce. Saturday is general market day. Newcastle is well supplied with surface water, the chief place of collection being Hallington, about 20 miles n.w. of the town.

The trade of Newcastle consists chiefly in coal, and in those articles in the production of which great heat is required. The Newcastle coal trade had its origin in the reign of Henry III. This branch of industry is not now confined to Newcastle, but is spread over the greater part of the sea-board of Northumberland and the whole of Durham. Nearly 32,000,000 tons of coal and coke were produced in the northern coal field in 1876, of which about 7,000,000 tons were shipped to foreign ports. The number of persons employed in connection with the pits may be computed at 80,000. Since the discovery of the Cleveland ironstone the manufacture of iron has prodigiously increased in the district embraced by the northern coal field. The make in 1876 was about 830,000 tons.

There are annually produced on the Tyne about 3,000 tons of steel. Large quantities of lead, the produce of the mines of Alston Moor and Weardale, are brought to Newcastle for manufacture. A very large quantity of unrefined lead is also imported from Spain. Having been refined and desilverized, the lead is rolled into sheets and pipes, or converted into shot, litharge, red and white lead. The value of these imports is about £1,000,000 per annum. Copper, to the extent of £200,000 worth, is annually got from the copper pyrites used at the chemical works of the Tyne.

At Newcastle the railway system had its origin. Here, as might be expected, locomotive and engineering establishments are found upon a great scale. The ordnance works of sir William Armstrong at Elswick, the western part of Newcastle, are well known. Iron ship-building and various branches of engineering are extensively carried on upon the Tyne. Newcastle occupies an important position in the manufacture of soda, bleaching-powder, vitriol, and other chemical products, the annual value of which is about £1,300,000. There are decomposed in the district 200,000 tons of salt per annum. Earthenware is largely manufactured, window glass and flint glass have declined; impressed glass is largely manufactured, and plate-glass is made. Glass-staining has attained great perfection. The fire-brick trade is a new industry, which has attained gigantic proportions. About 80,000,000 fire-bricks are annually made, besides gas-retorts and sanitary pipes, which are sent all over the world. About 100,000 grindstones leave the Newcastle quarries annually. Portland and other cements are made to the extent of 11,000 tons in a year.

The river Tyne, from the sea to Newcastle, forms a natural dock for the accommodation of shipping. Three artificial docks have, however, been constructed at a cost of £1,700,000. Within the last 20 years improvements upon a large scale have been made by the river Tyne commission. The entrance to, and many parts of the river have been deepened by dredging. The depth of water on the bar has been increased from 6 to 33 ft. at low water. In 1876, 10,194 vessels of 2,871,700 tons entered the Tyne ports (Newcastle, with North and South Shields); and 15,931, of 5,233,120 tons, cleared.

Of the benevolent institutions established in Newcastle there are an infirmary, a dispensary, asylums for the blind, the deaf and dumb, and two orphanages. The literary and philosophical society, the society of antiquaries, the natural history society, the mechanics' institution, and the institution of mining engineers (to which has been recently added a large hall, as a memorial of Nicholas Wood, an engineer of celebrity) successfully cultivate their several fields of labor. A college of physical science, with four professorships (geology, experimental philosophy, chemistry, and mathematics) was established in 1871 in connection with the university of Durham; and there is also in Newcastle, associated with the same university, a college of medicine.

Lords Stowel, Eldon, and Collingwood, Mark Akenside, and Hutton, the mathematician, were natives of Newcastle. Intimately connected with it, though not born in it, were Thomas Bewick, the engraver; Robert Morrison, the Chinese scholar; and George and Robert Stephenson.

NEW CHRISTIANS, the name given to Jews who, 400 years ago, were compelled by the Spanish inquisition to embrace Christianity in order to escape torture and death. Many outwardly complied, while their secret attachment to their own religion was unchanged. But their persecutors, not satisfied with outward professions, and finding that Jewish services were still secretly held and Jewish customs rigidly maintained, resolved to seize the property of the obstinate ones even if they could not gain possession of their minds and hearts. They consequently ordered the arrest of several of the suspected converts and the confiscation of their goods, and denounced excommunication against all who favored or helped them. The Dominican convent at Seville, where the inquisition was held, being soon crowded with the prisoners, the tribunal was removed to the castle of Triana in the vicinity of the city. A second edict commanded every person, under penalty of excommunication for mortal sin, to inform against all who had relapsed into Judaism or were suspected of having done so. Sentences of death were soon pronounced. In that year about 300 New Christians were burned alive in Seville, 2,000 in other districts of Andalusia, and 17,000 were subjected to minor penalties. The property of all who were put to death was seized. The terror thus excited induced a large number of "New Christians" to flee into Portugal, where many Jews resided, and were treated with unusual justice. They had consequently become well educated, and filled, to some extent, the places of the expelled Moors as the authors, merchants, and physicians of the land. From their academy in Lisbon went out skillful mathematicians, grammarians, poets, theologians, botanists, and geographers. By steadfastness and united action, combined with native talent, they acquired great influence through the kingdom. But their superiority aroused popular jealousy, which at length produced an edict for their expulsion from Portugal. Soon the storm burst severely on the New Christians. In 1506 the plague raged violently in Lisbon and was aggravated by famine. During these combined calamities, while the people were offering up prayers for divine interposition, on Sunday, April 19, a brilliant light illuminated the figure of Christ. While many doubted the genuineness of the miracle one of the New Christians was bold enough to express publicly his unbelief. This arousing the populace, they seized the man and burned him at the stake. This one death was like a spark that kindles a conflagration. Within three days more than 2,000 persons were put to death; old men, women, and children were burned in the fire that raged in the public squares. The king was absent from Lisbon, but on hearing of the outrage, with righteous indignation, inflicted summary justice on the leaders of the massacre and on the magistrates who had failed to resist and stop it. Terrified by such calamities many both of the Jews and New Christians fled to Holland, where those of their nation enjoyed complete toleration. The king, anxious to keep all he could of such valuable citizens, commanded that children under the age of 14 should be retained and instructed in Christianity. This was a cruel order, but it doubtless impelled many Jews to profess Christianity. The Jewish historians affirm that the exodus of their people was complete both from Portugal and Spain; but Jewish physiognomy and family traditions alike prove that the movement was not universal. There certainly are many Jews in Portugal, and Jewish blood flows in the veins of many noble Roman Catholic families there. In modern times the descendants of New Christians have gradually lost all traces of their national faith. Family names alone point them out. But in remote provinces some traces of the ancient worship remain, especially in observing the great day of atonement. A few families abstain from eating bread during the passover, and many retain the sacred Jewish prayer.

NEWCHURCH, a very thriving t. of Lancashire, England, 19 m. n. from Manchester, in Rossendale, not far from the source of the Irwell. It has recently and rapidly risen to its present importance. There are numerous cotton and woolen manufactories, employing many operatives. Coal is also wrought in the neighborhood, and there are numerous large quarries of excellent freestone. Pop. about 4,000. The neighborhood is very populous, abounding in manufactories and other public works. Not much more than a m. to the w. of Newchurch, is Rawtenstall, a large village, now almost a town, and rapidly increasing.

NEW COLLEGE, OXFORD. The college of St. Mary of Winchester, in Oxford, commonly called New College, was founded by William of Wykeham, bishop of Winchester and lord high chancellor, in 1386. The buildings are magnificent, and the gardens of great beauty. The most remarkable peculiarity of New College is its connection with Winchester school, another noble foundation of Wykeham. After the kin of the founder (to whom a preference was always given), the fellows were to be taken from Winchester. The late practice was that "two founders," as they were called, were put at the head of the roll for Winchester, and two others at the head of the roll for New College. In 1851, the college consisted of a warden and 70 fellows (elected in this way from Winchester), 10 chaplains, 3 clerks, and 16 choristers. By the ordinances under 17 and 18 Vict. c. 81, considerable changes were introduced, but the connection of the college with Winchester was in great measure preserved. The number of fellows was fixed at 30. Of these, 15 are open only to those who have been educated at Winchester, or who have been for 12 terms members of New College. The other 15 are open without restriction. The value of the fellowships is not to be more than £200 per annum, so long as their number is less than 40 There are also to be 30 scholarships, tenable for 5 years, of value not less than £80 per annum, inclusive of rooms, to be appointed by the warden and fellows of New College, by the election of boys receiving education at Winchester school. No conditions of birth are to be regarded in the election either of fellows or scholars. By a subsequent statute, the chaplains are made three in number, and from 8 to 10 choral scholars are added, to be upon an equality with the other scholars. This college presents to 40 benefices, and elects the warden of Winchester college.

NEWCOMB, HARVEY, D.D., 1803-63; b. Vt., taught school for 8 years at Alfred, N.Y.; in 1823 became editor and publisher of the *Western Star*, Westfield, N. Y., and two years later was editor of the *Buffalo Patriot*. In 1830-31, he published the *Christian Herald* at Pittsburg, Penn., and for several years was engaged by the American Sunday school union in the preparation of books for the young. In 1840 he was licensed to preach, and in 1841 became pastor of the Congregational church at West Roxbury, Mass., and afterward of the churches at West Needham and Grantville. In 1849 he was for a year assistant editor of the Boston *Daily Traveller*, and in 1850-51 of the *New York Observer*. He spent several years after this in establishing Sunday schools in Brooklyn, N. Y., and supplied the Park st. mission church of that city, and in 1859 was installed pastor of the Congregational church in Hancock, Penn. He was a regular contributor to the *Boston Recorder* and other religious papers. Dr. Newcomb was a copious writer, being the author of 178 volumes, most of which were designed for children and youth, and had a large circulation. His largest work was *Cyclopedia of Missions*, a book of great value at the time.

NEWCOMB, SIMON, LL.D.; b. Nova Scotia, 1835, came to the United States when a boy and here received his education, graduating at the Lawrence scientific school, Cambridge. From an early age he displayed remarkable proficiency in the higher mathematics and astronomy. For some years he taught school in Maryland, and in 1857 took part in the preparation of the *Nautical Almanac* for that year. He now began to attract the notice of the scientific world by his original investigations in astronomy, and in 1861 was appointed mathematical professor in the naval department and placed in charge of the naval observatory. In this position he made the contract and supervised the details of the purchase, construction, and mounting of the great telescope. In 1871, he was secretary of the commission created by congress to arrange for the thorough scientific observation of the transit of Venus of Dec. 9, 1874. He was made a foreign associate of the English royal astronomical society in 1872, and two years later a gold medal was bestowed upon him by the same society for his tables of Neptune and Uranus. He is also a member of the French institute and of many American societies. In addition to his scientific attainments he has given attention to finance and political economy, and has delivered a course of lectures at Harvard college on kindred topics. Besides many scientific papers he has published *Popular Astronomy* (1880), *The A. B. C. of Finance*, and *A Critical Examination of the Financial Policy during the Rebellion* (1865).

NEWCOME, WILLIAM, D.D., 1729–1800; b. Bedfordshire, Eng.; educated at the grammar school and the university of Oxford, first a student at Pembroke college, and then a fellow and tutor of Hertford. He suddenly and rapidly rose to preferments. In 1765 he was appointed chaplain to the earl of Hertford, lord-lieut. of Ireland. In 1766 he was made bishop of Dromore, Ireland, and afterward of Ossory and Waterford, and in 1785, archbishop of Armagh. He faithfully performed his official duties, securing the respect of all parties. He was a diligent Biblical student, and published several valuable works, of which the first was, *The Harmony of the Gospels*, containing much important critical information. His other works are, *The Duration of our Lord's Ministry particularly considered*, *Observations on our Lord's Conduct as a Divine Instructor, and on the Excellence of His Moral Character;* a new version with critical remarks on the *Twelve Minor Prophets and Ezekiel.* His next work was, *A Historical View of the English Biblical Translations.* His last work, except an episcopal *Charge*, was, *An Attempt toward Revising our English Translation of the Greek Scriptures.* This was printed four years before his death, but not published till afterward.

NEWDIGATE, Sir ROGER, 1719–1806; b. England, patron of the Newdigate prizes at the university of Oxford, where he was educated at Westminster school and University college, and became distinguished as a classical scholar, of refined taste and brilliant attainments. He was a member of the house of commons for Middlesex 1751–80, representing the university of Oxford. He established the prizes for the best English verses on the arts of painting, sculpture, and architecture; having given to that institution Piranesi's works on architecture and antiquities, and the candelabra in the library founded by Dr. John Radcliffe.

NEW'EL, the central column or spindle formed by the ends of the steps of a circular staircase, and round which the stair winds. In turret-stairs, it is a plain roll; but in Elizabethan and old Scotch castles, there are frequent examples of handsome staircases of this kind with ornamental newels.

NEWELL, HARRIET (ATWOOD), 1793–1812; b. Mass. She was the first American woman who went as missionary to India. She sailed for India with her husband Samuel Newell, and Adoniram Judson and wife, Feb. 19, 1812. They were forbidden by the East India company to remain in Calcutta, and sailed Aug. 4 for the Isle of France. "Their passage was long and perilous. After having been driven about for a month in the bay of Bengal during which Mrs. Newell was sick of a fever, the ship put in to Coringa in distress. They left that port and early in November arrived at the place of their destination. About three weeks before their arrival, Mr. and Mrs. Newell committed to the deep the body of an infant daughter, five days old. From this time Mrs. Newell rapidly declined. Her disease, the consumption, baffled medical skill, and on Nov. 30 at Port Louis she was released from the toils and sorrows of this mortal life." A volume containing her life and writings was published by the American Sunday school union A memoir of her by Dr. Woods has been widely circulated in several languages. She was much beloved at home, and many hearts were touched by the example of her early consecration. It may be that her death causing the knowledge of this example to be so widely diffused, and calling attention to the great missionary work, effected more for the heathen than a long life of labor would have done.

NEWELL, ROBERT HENRY, b. New York, 1836; engaged in business in his early life, but when about 21 entered upon the career of a journalist and literary man. He was connected with the *Mercury* of New York, 1858–63, and there first published the humorous articles in burlesque style under the pseudonym of Orpheus C. Kerr (office-seeker), on which his literary reputation mainly rests. Several volumes of these papers were published, and had a large sale. In 1868 Mr. Newell visited California, and has since published several volumes of prose and poetry. He has been a contributor to the *New York World* and editor of the *Hearth and Home.*

NEWELL, SAMUEL, 1785–1820; b. Mass.; graduated at Harvard college 1807. While engaged in the study of theology at Andover, he with five other students signed a paper addressed to the general association of Massachusetts (Congregational), expressing their desire to go as missionaries to the heathen and asking advice. It was this appeal that led to the formation of the American board. He married Harriet Atwood, and Feb. 19, 1812, sailed for Calcutta. Arriving there they were forbidden by the East India company to remain within their jurisdiction, and sailed for the Isle of France. After being driven about for a month in the bay of Bengal, the ship put in at Coringa in distress. Again sailing, their little daughter died, and was buried in the ocean. Soon after their arrival Mrs. Newell also died and was buried on the island. Mr. Newell went to Ceylon, and afterward to Bombay, where he died of cholera. He was greatly endeared to the friends of missions by his devotedness and peculiarly amiable character. He wrote with Mr. Hall while at Andover, *The Conversion of the World, or Claims of Six Hundred Millions*, a work of thrilling interest which had great effect in churches in awakening a missionary spirit.

NEW ENGLAND, a collective name given to the six eastern states of the United States of America—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut—including an area of 65,000 sq. miles. The people, distinctively known as Yankees, and mostly descended from an English Puritan and Scottish ancestry, are engaged in commerce, fisheries, and manufactures, and are celebrated for industry and enterprise. This region was granted by James I. to the Plymouth company in 1606, under the title of North Virginia, and the coast was explored by capt. John Smith in 1614. See accounts of the several states.

NEW FOREST, the name of a district in Hampshire (q.v.), triangular in shape, and bounded on the w. by the river Avon, on the s. by the coast, and on the n.e. by a line running from the borders of Wiltshire along the Southampton water. Area about 64,000 acres. This triangle appears to have been a great wooded district from the earliest times, and its present name dates from the Norman conquest, when it was regularly afforested. Since that period it has remained a possession of the crown, subject to rights of "pannage," vert (greenwood), and turf-cutting, claimed by various estates in or near the forest. During the "pannage" month, which commences at the end of September, and lasts for six weeks, the borderers drive in herds of swine to feed on the mast in the forest, and this right they obtain by paying a small annual fee in the Stewarts court at Lyndhurst, which is considered the capital of the forest. Formerly this district was the haunt of numerous "squatters," but their huts are now rarely to be seen. Gipsies, however, still congregate here in considerable numbers. In 1854 a commission was appointed to examine the extent and nature of the rights of pannage, etc., claimed by the foresters and borderers, and in a large majority of cases the claims were confirmed. The principal trees in the forest are the oak and beech, with large patches of holly as underwood. The oaks have been much used as timber for the British navy. Tracts of exquisite woodland scenery are everywhere to be met with. The afforestation of this district by the conqueror, enforced by savagely severe forest laws, was regarded as an act of the greatest cruelty, and the violent deaths met by both of his sons, Richard and William Rufus—both of whom were killed by accidental arrow-wounds in the forest—were looked upon as special judgments of providence. A small breed of pony lives wild under its shelter.

NEWFOUNDLAND, an island and British colony of North America, not yet incorporated with the Dominion of Canada, lies at the mouth of the gulf of St. Lawrence, separated from Labrador on the n. by the straits of Belle Isle (about 12 m. broad), and extending in lat. from 46° 38′ to 51° 37′ n., and in long. from 52° 44′ to 59° 30′ west. In shape it resembles an equilateral triangle, of which cape Bauld on the n., cape Race on the s.e., and cape Ray on the s.w. form the angles. It is 370 m. in length, 290 m. in breadth, and has an area of 40,200 sq. miles. Pop. '69, 146,536; '74, 161,486.

The island, as seen from the sea, presents a wild and sterile appearance. Its surface is diversified by mountains, marshes, barrens, ponds, and lakes. The mountains in the Avalon peninsula (stretching s.e. from the main portion of the island, and connected with it by an isthmus of only about 3 m. in width) rise, in some cases, to 1400 ft. above sea level; while both here and along the western shore the height of 1000 ft. is frequently reached. The number of the lakes and "ponds" (the latter name being used indiscriminately for a large or a small lake) is remarkable, and it has been estimated that about one-third of the whole surface is covered with fresh water. The "barrens" occupy the tops of hills. The coast line is everywhere deeply indented with bays and estuaries, many of which are spacious enough to contain the whole British navy. Of these inlets, the principal, beginning from the northern extremity of the island, are Hare, White, Notre Dame, Bonavista, Trinity, Conception, St. Mary's, Placentia, Fortune, St. George's, and St. John's bays. These bays vary in length from 25 to 70 m., are of great breadth, and are lined—as indeed the whole coast is—with excellent harbors. The rivers, none of which are navigable for any distance, communicate between the lakes of the interior and the shore, and are narrow and winding. The main streams are the Exploit, with its affluent the Great Rattling, and the Humber. Much of the soil is sterile and unproductive, although there is considerable cultivation along the sea-board of the settled districts, limited principally to the s.e. coast; exploration has shown that the best land and the best timber are in the interior. The great body of the people being employed either in the fisheries or in establishments connected with them, little attention used to be paid to the culture of the soil; but very considerable improvements in this respect have latterly been made by the enterprising islanders. In 1845 the only crops raised were oats and hay; but within recent years large supplies of grain, vegetable, and garden seeds have been imported; and now about 600,000 bushels of potatoes are produced annually, and turnips, hay, carrots, clover, barley, and oats are cultivated with success. The island possesses some minerals, among which are marble, limestone, gypsum, roofing-slate, and coal—the last found only in small quantities; also copper, nickel, lead, and iron. One rich copper mine is worked, though mining is still in its infancy here. Trees, of which the chief are pine and fir, birch, and willow, thrive only in the more fertile districts.

The fisheries are of two kinds—the "shore fishery" and the "bank fishery;" the former comprises the shores and bays of Newfoundland; the latter comprises a great tract known as the "banks" of Newfoundland, from 500 to 600 m. in length, and about 200 m. in breadth. The banks form the greatest submarine plateau known; the depth of the water is from 20 to 108 fathoms, and the most productive "ground" is said to extend between lat. 42° and 46° north. Great variety of valuable fish is found in the waters around the colony, as the cod, salmon, herring, etc. The principal articles of export are fish—comprising dry cod, herring, and salmon—and cod-oil. Of dry cod, 970,176 quintals, value £810,943, were exported in 1870; 3,593 tuns of unrefined cod-oil, value £107,813; 404 of refined cod-oil, value £21,068; 4,982 of seal-oil, value £176,472; and 265,189 sealskins, value £55,248. The imports are chiefly provisions, as bread, butter, tea, etc.—cordage and cables, and manufactured goods. The imports and exports for 1874 amounted in value to £1,532,227 and £1,528,341 respectively. The revenue of Newfoundland in 1875 was £197,283; the expenditure, £197,694. In 1873 the total tonnage of vessels that entered and cleared the ports was 412,024. Newfoundland possessed itself 1301 vessels of 68,185 tons.

The seal affords one of the most important fishing interests of Newfoundland. This industry may commence any day from Feb. 25th to March 5th. according to the winds—a n.e. wind blocking up the coast with ice, which the first strong westerly wind clears away. At the beginning of the present century, the seal-fishing was carried on with vessels of from 30 to 40 tons, manned by 8 or 10 men. Vessels of from 70 to 180 tons, manned by from 25 to 90 men, were substituted for these, the most suitable being vessels of from 120 to 140 tons. About 1866, steamers were introduced into the seal-fishing, and they have proved so serviceable that it is probable that this kind of vessel will, by and by, be used exclusively in these fisheries. In proportion to the population of Newfoundland, its religious institutions are ample, while education is within reach of all classes, government grants to the district schools being liberal.

There are no railways in the island, and its peculiar configuration renders even road-making a matter of great difficulty. There are no roads across the island; they are confined chiefly to the south-eastern and south-western sea-board. There is weekly communication for nine months in the year between Newfoundland and Europe. In the colony and connected with it, 400 m. of lines of telegraph have been constructed, and the Atlantic telegraph has its western terminus on this island.

The early history of Newfoundland is involved in obscurity. It was discovered, June 24, 1497, in the reign of Henry VII., by John Cabot; and the event is noticed by the following entry in the accounts of the privy-purse expenditure: "1497, August 10, To hym that found the New Isle, £10." It was visited by the Portuguese navigator, Gaspar de Cortereal, in 1500; and within two years after that time, regular fisheries had been established on its shores by the Portuguese, Biscayans, and French. In 1578, 400 vessels, of which 50 were English, were engaged in the fishery. Sir Humphrey Gilbert, with his ill-fated expedition, arrived in St. John's harbor, August 1583, and formally took possession of the island in the name of queen Elizabeth. In the return voyage, the expedition was scattered by a storm, and the commander lost. In 1621, sir George Calvert (afterward lord Baltimore) settled in the great peninsula in the s.e., and named it the *Province of Avalon*. The history of the island during the 17th and part of the 18th centuries, is little more than a record of rivalries and feuds between the English and French fishermen; but by the treaty of Utrecht (1713), the island was ceded wholly to England; the French, however, retaining the privilege of fishing and drying their fish on certain portions of the coast. A governor was appointed in 1728. The present form of government, established in 1855, consists of the governor, a legislative council (appointed by the crown), and a general assembly (elected by the people). The coast of Labrador on the mainland, and the island of Anticosti, have been included, since 1809, within the jurisdiction of the governor of Newfoundland.

NEWFOUNDLAND DOG, one of the most sagacious and esteemed of the large kinds of dog. It is said to have been originally derived from Newfoundland, where it is used chiefly as a beast of draught, to convey light loads of wood or provisions, on sledges, over rugged tracks. Multitudes of these dogs, in St. John's and elsewhere, are left to shift for themselves during the fishing season; and are again called to service when required by their masters. There are several varieties of Newfoundland dogs, particularly a smooth breed, with rather small head, white and spotted with black, which seems now to be extinct; a very large breed, with broad muzzle, head raised, noble expression, waved or curly hair, very thick and bushy curled tail, black and white color; and a smaller almost black breed. Some of the breeds seem to be crossed with hounds and other dogs. The Newfoundland dog is remarkable for memory, and for patience and forbearance of temper. It is, however, apt to become irascible in confinement, and will then bite even its master. Some of the most interesting anecdotes of the affection and sagacity of the dog, relate to the Newfoundland dog. No dog excels it as a water-dog. Its paws are half-webbed. Its power of endurance in swimming is very great.

NEWGATE, a celebrated London prison, stands at the western extremity of Newgate street. opposite the Old Bailey. It is the chief criminal prison for the city and county. The exterior presents high dark stone walls, without windows, and with entrances from the side next the Old Bailey, in front of which public executions take place. The earliest prison here was in the portal of the *new gate* of the city, as early as 1218; and hence the name. About two centuries afterward, it was rebuilt by the executors of sir Richard Whittington, whose statue with a cat stood in a niche, till its destruction by the great fire of London in 1666. Shortly after, it was reconstructed, from which time, till 1780, the date of the erection of the present edifice, its condition was, in a sanitary point of view, horrible. Mr. Akerman, one of the keepers, in his evidence before the house of commons in 1770, stated, as a proof of this, that in the spring of 1750 the jail distemper, spreading to the adjoining sessions house, caused the death of "two of the judges, the lord mayor, and several of the jury and others, to the number of 60 persons and upwards." The place, however, is now kept in the cleanest possible condition. The cells for condemned prisoners are at the n.e. corner, next to Newgate street. The *Newgate Calendar* contains biographical notices of the most notorious murderers, burglars, thieves, and forgers who have been confined within its walls.

NEW GRANADA, since Sept. 1861, has been officially styled *The United States of Colombia.* This federative republic was formed at the convention of Bogota, at the date specified, and consists of nine "states," Panama, Santander, Cauca, Boyaca, Cundinamarca, Antioquia, Tolima, Bolivar, Magdalena. It is bounded on the n. by the Caribbean sea; on the w. by Costa Rica, a republic of Central America, and by the Pacific; on the s. by Ecuador and Brazil; and on the e. by Venezuela. Area, 513,783 sq.m.; pop. '70, 2,894,992, of whom nearly a half are of European descent. By a constitution dated May 1863, the executive authority is vested in a president elected for two years. while the legislative power rests with a senate and a house of representatives. The federal army of this republic consists of 3,000 men on the peace footing, but in a time of war each state is bound to furnish a contingent of one in a hundred of its population. The revenue in 1878 was $4,868,800, and the expenditure $7,271,933. The public debt in the same year was close on $16,000,000. The total imports in 1876–77 had a value of $6,709,109; the exports $10,049,071. Besides the railway across the isthmus of Panama, there is another short line; and about 1,250 miles of telegraph are in operation.

The country is intersected by three great ranges of the Andes, which spread out like the rays of an open hand from the plateau of Pasto and Tuquerrez in the s. (14,000 ft. high), and are known as the western, central, and eastern Cordillera. Between these chains lie the long and beautiful valleys of the Cauca and the Magdalena. The central Cordillera is the highest chain, rising in Nevada de Tolima to a height of 18,020 ft, and and from one of its peaks, near the frontiers of Ecuador, called the Paramo de las Papas, descend the two principal rivers of New Granada, the Magdalena and its tributary the Cauca, flowing n. in the Caribbean sea, besides several affluents of the Amazon in the e. and one or two streams flowing westward into the Pacific. The eastern Cordillera is by far the largest chain, and consists of a series of vast table-lands, cool and healthy, where the white race flourishes as vigorously as in Europe. This temperate region is the most densely peopled portion of the confederation, being, in some places, at the rate of 2,600 to the square league, Bogota (q.v.) the present capital, is situated on one of these plateaux, at an elevation of 8,694 feet. Eastward from this Cordillera stretch enormous plains as far as the Orinoco, the greater part of which belongs to New Granada, and through which flow the Meta, the Guaviare, and other tributaries of the Orinoco. The geology of the country is very extraordinary. "Everywhere," we are told, "are found traces of stupendous cataclysms, and a disarrangement and intermixture of primitive and sedimentary rock, which seem to put all classification at defiance." In the course of one day's journey, the traveler may experience in this country all the climates of the world. Perpetual snow covers the summits of the Cordilleras; while the rich vegetation of the tropics covers the valleys. With its great variety of levels and climates, New Granada yields naturally an equally great variety of productions: cattle, horses, wheat and other European grains, maize, tobacco, coffee, plantains, cotton, cacao, sugar, cedar, mahogany, cinchona bark, ipecacuahna, gold, silver, copper, iron, and lead, coal, emeralds, pearls, and rock-salt.

By the constitution, complete toleration in matters of religion and worship, the freedom of the press, a system of parish schools, with gratuitous primary education, and many other important helps to civilization and liberty have been established. The inhabitants rank first among the South Americans in point of literary and scientific culture. There are at present about 1000 public schools in the country, many seminaries and colleges for higher and professional instruction; there are printing establishments, periodicals, and numerous literary, scientific, and benevolent institutions.

The chief aborigines of the country, called *Chibchas* or *Muyscas,* held a high rank among the semi-civilized nations of the New World. They are said to have been frugal and industrious, with a well-organized government and a very passable religion—for heathens. They were conquered by Ximenes de Quesado (1536–37), and their descendants are now "Christians," and speak the Spanish language. Several of the other tribes still maintain a savage mode of life; and some, as the Mesayos, are even said to be cannibals. In 1718, New Granada was erected into a vice-royalty by Spain. In 1819, it became independent, and then joined with Ecuador and Venezuela to form the republic of Colombia; but the union was dissolved in 1829–30, and New Granada was organized as a separate republic in 1832. After several changes in the constitution (in 1843, 1851, 1853), a complete fundamental change was made in 1858, by which the separate "provinces" were changed into "states," associated under a federal government like the "United States" of North America, but self-governing in all internal affairs. In 1860, another revolution broke out, and for more than two years, the country was devastated by civil war. Finally, on Sept. 29, 1861, a convention was concluded between the conservatives or federalists, and the "liberals," which put an end to the strife. As the victory lay with the latter, certain changes have again been made in the constitution, and the country is now, as stated above, officially designated the "United States of Colombia." The first president under the new form of the constitution commenced his term of office on April 1, 1864.

NEW GUI'NEA. See PAPUA.

NEWHALL, FALES HENRY, D.D., b. Mass. 1827: studied at Wesleyan university, Middletown, Conn., (Methodist Episcopal), and graduating in 1846, taught school 7 years, and in 1853 entered the ministry. In 1863 he accepted the chair of rhetoric and English literature in Wesleyan university, which he held until 1871. In 1867 he went abroad for a year, and 1873 was elected president of the Wesleyan university at Delaware, Ohio.

NEW HAMPSHIRE, one of the original thirteen United States of America, in lat. 42° 41′—45° 11′ n., long. 70° 40′—72° 28′ w., is 176 m. long, and on an average 45 m. wide, having an area of 9,280 sq.m., or 5,939,200 acres. It is bounded n. by Canada, e. by Maine and the Atlantic ocean, s. by Massachusetts, and w. by Vermont, from which it is separated by the Connecticut river. It has ten counties; the chief towns are Manchester, Portsmouth, Dover, Nashua, Keene, and Concord, the capital. The population, except the recent influx of Irish in the manufacturing towns, is almost entirely descended from the original English and Scottish settlers. It has 18 m. of sea-coast, and one seaport, Portsmouth, at the mouth of the Piscataqua river, with a deep and commodious harbor. Its other chief rivers are the Connecticut and the Merrimack. It is a state of mountains and lakes, much visited by tourists, and called "The Granite State" and "The Switzerland of America." The White mountains lie in the n. central region. Their highest summits are Mt. Washington, 6,285 ft.; and Mt. Lafayette, 5,500 ft. A notch in the White mountains, 2 m. long, and in the narrowest part only 22 ft. wide, affords passage to a road and mountain stream, and is much visited. The lakes and rivers of New Hampshire occupy in all about 110,000 acres. Lake Winnepiseogee is 25 m. long by 1 to 10 m. wide, with 360 islands, from a few yards to many acres in area, mostly covered with evergreens. The rocky strata consist of metamorphic rock, mica, and talcose slates, quartz, granular limestones, granite, gneiss, and contain magnetic and specular iron ores, beryls, tourmalins, mica, graphite, and steatite or soap-stone. The soil, except in the fertile valleys, is better adapted to pasturage than culture. The winters are long and cold, so that in the mountainous regions mercury sometimes freezes. In the forests are oak, maple, pine, hemlock, spruce, etc. The chief agricultural products are maize, rye, oats, apples, potatoes, and products of the dairy. Numerous water-falls give motive power to many cotton-factories, woolen, iron, and paper-mills, etc. The state has 915 m. of railway, 45 national and 65 savings banks, a college (at Dartmouth), 700 churches, 50 newspapers, an excellent system of free school, and government and judiciary similar to all the American states. New Hampshire was settled in 1623 by colonists from Hampshire in England, who suffered during the colonial period from Indian wars and depredations. The state was organized in 1776. It has furnished a a multitude of emigrants to the newer and more fertile western states. Pop. '10, 214,360; '40, 284,574; '70, 318,300.

NEW HAMPSHIRE (*ante*), was first visited by capt. John Smith, the English navigator, in 1614, and next by a capt. John Mason and sir Ferdinand Gorges. In some of the earliest histories it is called Laconia, and in others capt. John Mason's Patent, and Pascataqua. The first settlements were made at Dover and Portsmouth in 1623, and 12 years later another was formed at Exeter; but the settlers were unable to defend themselves against the Indians, and in 1641 all the settlements in the state united with the colony of Massachusetts. In 1679, however, Charles II. made it a separate royal province, with a president and council appointed by the crown, and an assembly chosen by the people. Then again from 1689 to 1692 it reunited with Massachusetts, which relation it continued 49 years before becoming for the third time an independent province. The settlements were gradually extended further w. than the original patent prescribed, and it was believed until 1764 that the territory at present included in Vermont formed part of the grant, a mistake that led to a vexatious controversy which lasted many years. In 1776 the state declared its independence, and a temporary government was established that continued during the revolutionary war, in which its people were among the most active and noted participators. The state was also represented in the continental congress, and ratified the constitution of the United States by a vote of 57 to 46. At a convention in Oct., 1783, a constitution was prepared similar to that of Massachusetts, and this as altered slightly six years afterwards is still the constitution of the state. In 1807 Concord was chosen as the permanent capital.

Previous to 1860 large gains in the state's growth were reported in every census; but by the census of that year it was found that there was a decrease of 2.38 per cent in the population, and for many years its agricultural interests have been declining. The soil never was very fertile, and much of the land which was once productive has become worn out by long use. This fact, in connection with the severity of the climate has caused many of the younger generation to seek new advantages in the west. In 1870 there were 72,144 families with an average of 4.41 persons to each, and 67,046 dwellings with an average of 4.75 to each. Of the total population 10 years of age and over (260,426) there were engaged in all occupations 120,168, which total was divided as follows: Agriculture, 46,573; manufacture, mechanical, and mining industries, 46,553; trade, 8,514; clergymen, 664; lawyers, 849; physicians, 565; laborers, 4,686; domestic servants, 7,481. The number of acres in farms was 3,605,994, of which 2,334,487 acres were improved. The value of the farms was estimated at $80,589,313, and of the farming implements and machinery, $3,459,943. The chief productions were: Winter wheat, 189,222 bushels; spring wheat, 4,399 bushels; rye, 47,420; Indian corn, 1,277,768; oats, 1,146,451; barley, 105,822; buckwheat, 100,034; peas and beans, 58,375; potatoes, 4,515,599; hay, 612,648 tons; tobacco, 155,334 lbs.; wool, 1,129,442 lbs.; butter, 5,965,080; cheese, 849,118; hops, 99,469; maple sugar, 1,800,704; honey, 56,944; maple molasses, 16,884 gallons. The value of all kinds of live stock in the state during the same year was estimated at $15,246,545. It included 43,335 horses, 90,580 milch cows, 40,513 working-oxen; 91,705 other cattle, 248,760 sheeps, and 33,127 swine. It is in manufactures rather than agriculture that the state ranks high. The busy cities of Manchester, Dover, and Nashua, together with the numerous smaller towns active with manufacturing industry, make it among the first in the union in this respect. Cotton and woolen goods, boots and shoes, machinery, and other iron and metallic wares, are the leading articles of manufacture; but paper, carriages, furniture, hosiery, leather, lumber, wooden-ware, and a large variety of other goods are extensively produced. In 1870 the total number of manufacturing establishments was 3,342, employing 40,783 hands, and using a capital of $36,023,743. The value of material used was $44,577,967, and of the products, $71,038,249. Of this amount the manufacture of cotton goods furnished the largest single item, $16,999,672; the woolen and worsted goods produced were valued at $10,150,729; lumber, $3,920,522; boots and shoes, $4,780,020; printing-cotton and woolen goods, $4,670,338; iron, rolled and castings, $1,369,568; furniture, $1,732,162; leather, tanned and curried, $3,686,096; machinery of all kinds, $3,003,563; paper, $1,088,285; carriages, wagons, and cars, $1,286,084; flouring-mill products, $1,270,226; hosiery, $1,757,445. As to the state's foreign commerce, it is usually very small. Portsmouth is its only port of entry; and in 1874 the value of imported goods received there amounted to about $41,000. The exports were not $200 in value. The number of American vessels that entered and cleared from the port were 25, with a tonnage of 5,959; the number of foreign vessels, 46, with a tonnage of 5,471. The number of railroads, with their branches lying wholly or partly in New Hampshire in 1875 was 12. These were the Boston, Concord and Montreal, 160 m.; Boston and Maine, 34 m.; Cheshire, 42 m.; Portsmouth, Great Falls and Conway, 72 m.; Atlantic and St. Lawrence, 52 m.; Portsmouth, 59 m.; Concord 35 m.; Manchester, Lawrence and North Weare, 43 m.; Northern, 82 m.; Nashua and Rochester, 49 m.; Eastern, with Conway division, 89 m.; and Dover and Winnipiseogee, 28 miles. The number of national banks in operation in the state at the beginning of the same year was 43. Their capital amounted to $5,365,000; bonds on deposit, $5,342,000; outstanding circulation, $4,707,365. There were also two state banks and trust companies with $175.000 capital, and 68 savings-banks, which had deposits to the amount of $30,214,585. The fire insurance companies comprised 16 town companies, 6 mutual not limited to towns, and the New Hampshire joint-stock company. The amount of risks carried by the town companies was $2,241,627, and by the mutual $12,932,929. Besides these companies there were 56 fire and 5 marine insurance companies of other states and foreign countries licensed to transact business in the state.

In 1872 the assessed valuation of real and personal property in New Hampshire was reported by the assessors of the several cities and towns to be $152,987,177; but these returns were considered to be much below the real value, which was believed to be about $250,000,000. In 1879 the assessed valuation was $206,959,017. The state tax is divided among the cities and towns according to an apportionment made every four years, based on the assessed valuation of the taxable property. Railroads are taxed separately, the judges of the superior court determining the present value of the capital and assessing in proportion to the taxation of other property. The state income for the fiscal year ending May 31, 1879, was $1,173,104.10; the expenditures for the same period amounted to $1,109,347,20; leaving a balance on hand of $63,756.90. A month later the public debt amounted to $3,573,550.90. This includes the municipal war loans, the burden of which has been assumed by the state.

The public school system of the state, like that of the other New England states, is carefully watched. The general supervision is vested in a state superintendent, and the several towns annually choose committees, among whom, since 1872, women are eligible to direct the conduct of the schools in their respective localities. A compulsory educational law was passed in 1871, requiring all children between 8 and 14 years of age to attend school at least 12 weeks of every year. In 1872 there were 2,149 district and 2,599 public schools in the state, of which 403 were graded schools. The number of children in attendance was 68,751; and there were only 4,164 children between the ages of 5 and 15 who attended no school. The whole number of teachers was 3,669, of whom 503 were males and 3,166 females. Besides the common public schools, there is a state normal school at Plymouth with 18 teachers, and also 50 academies, seminaries, and and private schools, which have about 160 teachers. These include some of the oldest and most noted schools in the country, such Phillips academy at Exeter, founded in 1781; St. Paul's school at Concord; the Kimball Union academy at Meriden, and the New Hampton literary institute at New Hampton. At Hanover, Dartmouth college is located, which, besides the college proper comprises the Chandler scientific school, the Thayer school of civil engineering, a medical school, and the New Hampshire college of agriculture and mechanic arts. (See DARTMOUTH COLLEGE.) The total amount of receipts in 1875 for public school purposes was $621,649, of which $539,165 was raised by taxation, $27,340 from a literary fund, $25,348 from local funds, and $31,284 by contributions from other sources. The amount expended the same year was $742,854, and the average appropriation for each registered scholar, $7.08. The estimated value of school-houses and lots in the state was $2,228,905, and of the school apparatus, $29,154. Of the public and private libraries, the census of 1870 reported 1,526, having 704.269 volumes, of which 856 with 379,876 volumes were private and the rest public. The largest library in the state is the one belonging to Dartmouth college, which numbers 57,000 volumes. The number of newspapers and periodicals printed in the state is about 60, there being 9 dailies, 44 weeklies, 6 monthlies, and 1 quarterly. The religious organizations of all denominations in 1874 numbered 633, and they possessed 624 edifices with 210,000 sittings, and property valued at $3,303,780. The denominations were divided as follows: Baptists, 102; Free-will Baptists, 82; Christians, 19; Congregationalists, 169; Protestant Episcopalians, 21; Friends, 13; Methodists, 118; Presbyterians, 7; Roman Catholics, 17; Second Adventists, 21; Shakers, 2; Unitarians, 28; Universalists, 24; Union, 12.

The constitution of New Hampshire extends the right of suffrage to every male citizen who is 21 years of age and who has resided in one town six months previous to election, excepting paupers and persons who are excused from paying taxes. Only Protestants, according to the constitution, are eligible to the office of governor, or are eligible as senators or representatives. The executive department consists of a governor, five councilors, secretary of state, treasurer, commissary-general, and superintendent of public instruction, who are elected annually. All the judicial officers, such as the attorney-general, solicitor, sheriffs, coroners, registers of probate, and general field officers of the militia, are appointed by the governor. The judicial power is vested in a superior court of judicature and a circuit court, probate court, police courts, and justices of the peace. The legislature, styled the general court, comprises a senate of 12 members and a very large house of representatives. The state is represented in congress by two senators and three representatives. The electoral votes have been cast as follows: 1788, Washington and Adams, 5; 1792, Washington and Adams, 6; 1796, Adams and Ellsworth, 6; 1800, Adams and Pinckney, 6; 1804, Jefferson and Clinton, 7; 1808, Pinckney and King, 7; 1812, Clinton and Ingersoll, 8; 1816, Monroe and Tompkins, 8; 1820, Monroe and Tompkins, 7; 1820, Adams and Rush, 1; 1824, Adams (for president), 8; Calhoun (vice-p.), 7; Jackson (vice-p.), 1; 1828, Adams and Rush, 8; 1832, Jackson and Van Buren, 7; 1836, Van Buren and Johnson, 7; 1840, Van Buren and Johnson, 7; 1844, Polk and Dallas, 6; 1848, Cass and Butler, 6; 1852, Pierce and King, 5; 1856, Fremont and Dayton, 5; 1860, Lincoln and Hamlin, 5; 1864, Lincoln and Johnson, 5; 1868, Grant and Colfax, 5; 1872, Grant and Wilson, 5; 1876, Hayes and Wheeler, 5; 1880, Garfield and Arthur, 5.

NEW HANOVER, a co., in s. North Carolina, having the Atlantic ocean for its s. and s.e. boundary, the broad cape Fear river and its affluent the Black river for its w., intersected by the n.e. branch of the former river; about 850 sq.m., pop. '80, 21,387—20,834 of American birth, 13,224 colored. It is intersected by the Wilmington and Weldon, and the Wilmington, Columbia, and Augusta railroads, forming a junction at Wilmington, which is the e. terminus of the Carolina Central railroad. Its surface is generally level and largely covered with pine forests, sinking into low swampy land in some sections. Its soil is sandy and adapted to the cultivation of the vine. Stock is raised; also corn, sweet potatoes, rice, and wool. Its leading industries are the manufacture of carriages and wagons, railroad cars, cooperage, fertilizers, iron castings, and machinery. It has flour and saw mills; and lumber, tar, and turpentine, are the chief commodities. It has cotton factories, rice mills, and turpentine distilleries. Steamboats ply between its chief town and the ports of Baltimore and Charleston, and vessels stop here to recruit their stores. County seat, Wilmington.

NEW HARMONY, a village of Indiana, first settled in 1815 by a German community of religious socialists, called Harmonists, under the leadership of George Rapp. In 1824, the village and domain was purchased by Robert Owen, for an experimental community on his system. After the speedy failure of this society, the property was bought by William Maclure for a school of industry. It is now a flourishing western village of, '70, 836 inhabitants.

NEW HAVEN, a co. in s.w. Connecticut, bounded s. by Long Island sound, and w. and s.w. by the Housatonic river, which separates it from Fairfield co.; about 620 sq.m. Pop. '80, 156,526—119,218 of American birth, 1591 colored. Naugatuck river is the only stream of any size, though several small creeks and rivers empty into the sound; the principal railroads are the New York, New Haven, Hartford, and Springfield, with its shore line branch to New London; the New Haven and Northampton; the Boston and New York air line, and the Naugatuck. The surface is uneven; the soil sandy in places, and only moderately fertile; covered in part with forests of maple, oak, beech, elm, and hickory; the staples are potatoes, Indian corn, oats, tobacco, and dairy product. The manufactures are very extensive and profitable, especially at Waterbury, Meriden, Wallingford, and New Haven. Carriages, clocks, plated ware, hardware, machinery, bricks, pens, tools, cutlery, and rubber articles, being among the chief products. A proposition is now (1881) being agitated to set off the northern part, including Waterbury and some small towns, to form a new county. County seat, New Haven.

NEW HAVEN, the chief c. and seaport of Connecticut, U. S., at the head of a bay, 4 m. from Long Island sound, 76 m. e.n.e. of New York. Its broad streets are shaded with elms, and the public squares, parks, and gardens, with its handsome public and private edifices, make it one of the most beautiful of American cities. It is the seat of Yale college (q.v.), which has more than a dozen large buildings and a gothic library, 150 ft. long. There are a handsome custom-house, state-house, hospital, 51 churches, academies and schools, 9 banks, 5 daily papers, and 3 ornamental cemeteries. There are large manufactories of carriages, clocks, and leather, iron and india-rubber works. It has railway and steamboat connection with New York, etc. Pop. '70, 50,840.

NEW HAVEN (*ante*) is situated on a sandy plain inclosed between the Quinipiac and Mill rivers on the e. and the West river on the w.; East Rock and West Rock on either side are of volcanic formation, about 450 ft. in height, and front the city with their precipitous faces. The railroads which center here are the New York, New Haven, and Hartford—running w. and n. and with a branch, the Shore line, running to the e.; the New Haven and Northampton, the New York and Boston air line, and the Derby and New Haven; pop. '80, 62,882. The harbor is large but not of great depth; improvement is now being made by extensive dredging. The shipping business is considerable, but not as great, proportionately, as in former years, when a large trade was carried on with the West Indies. Two lines of steamboats run to New York, four boats leaving each port daily. The city is distant from Hartford, the capital, 36 m., from New London about 50 m., and from New York 76 miles.

New Haven was founded in 1638 by a Puritan colony under the rev. John Davenport and Theophilus Eaton, and with the adjoining towns of Guilford, Milford, Stamford, and Branford, constituted an independent colony until 1662, when it was brought under the same charter with Connecticut. Hartford and New Haven were then made joint capitals and continued so until 1873, when the constitution of the state was amended and Hartford became sole capital. There are both town and city governments, the latter under a special charter; the villages of Westville and Fair Haven are included in the city limits. There are ten wards, each sending two aldermen and three councilmen to the common council, who are elected annually, as is the mayor. The fire, police, and street departments, are controlled by boards of commissioners, and are very efficient. Taxes are moderate and, including that for the school fund, amount to about 16 mills on the dollar. The city has long been called "Elm City," from the great number of ancient elms which adorn its streets and parks, most of which were planted at the end of the last and beginning of this century. The public square or "green" lies in the center of the city as originally laid out, and is surrounded by a double row of elms, which also border Temple street passing through the green, and that part of the college grounds adjoining. In this park are three churches; one, the oldest in the city, has a crypt containing the tombs of many of the old heads of families of the state. Here also is the old state capital, in decay of late years. Behind Center church are the tombs of the "regicides," Goffe, Whalley and Dixwell, and upon the slope of West Rock may be seen a cave, or rather shelter among boulders, said to have been occupied by them as a place of concealment, and bearing the inscription "Opposition to tyrants is obedience to God." Among the principal streets are Chapel, Church, and State, the business thoroughfares, and Hillhouse avenue, Prospect, West Chapel, and Dwight streets, where are many of the best residences and handsome grounds. The town is remarkable for the abundance of trees and the absence of all crowding of residences, even in the center of the city. The most noteworthy public buildings are the post-office, city hall, and county court-house the finest buildings of the city, the police building, the public high school, the Peabody museum, and other of the college buildings. See YALE COLLEGE. There are nearly 50 churches; among the finest are Trinity and St. Paul's Episcopal, St. Mary's Roman Catholic, Church of the Redeemer, Congregational, and the Baptist church on Chapel street. Besides the various departments of the college, there are several academies for boys and young ladies, Hopkins grammar school being the best known. There is a fine high school and a good common school system. For many years New Haven has been largely engaged in the manufacture of clocks and carriages, and there are many factories for making the latter. Winchester's rifle, pistol, and cartridge factory; Candee's rubber works (the second largest in the world); Sargent's factory of domestic hardware, etc.; and Wheeler's iron works are among the largest concerns in the city. Among many other articles produced are pianos, organs, pins, fish-hooks, matches, paper boxes, all kinds of iron and brass ware, machinery, corsets, skirts, paper, and shoes. The city is the center of a large retail trade with the surrounding country, and through it passes nearly all the coal and freight of the New England states. The city debt is not burdensome, and consists mainly in bonds for the expense of the excellent sewerage system, and in aid of the Derby railroad. There are five daily newspapers, nine weeklies, several monthly magazines, and a quarterly published in the city. The college, which of late has assumed the features, though nót the name, of a university, has for over a hundred years been a center for much of the social life of the community, but this influence is now less dominant, as the city has greatly enlarged.

NEW HEBRIDES, a group of islands in the Pacific ocean, to the n.e. of New Caledonia, and to the w. of the Fijis, in s. lat. between 14° and 20°, and in e. long. between 167° and 170°. Total area estimated at 3,500 sq. miles. They are regarded as the most easterly point of the western division of Polynesia. The group embraces Espiritu Santo (65 m. long by 20 broad), Mallicollo (60 m. long by 28 broad), Vati Ambrym, Annatom, Erromango, and Tanna, with an active volcano. Aurora, one of the most fertile of the group, disappeared in 1871, leaving no trace. Most of the group are hilly and well wooded, some even mountainous. The most important woods are ebony and sandal; the principal edible products, yams, bananas, cucumbers, cocoa-nuts, and sweet potatoes; and the only animal of consequence, a diminutive species of hog, which, when full-grown, is no bigger than a rabbit. The inhabitants, who number about 200,000, are fierce, but are excessively dirty and unintelligent. Erromango is a well-known name in missionary history, being the scene of the barbarous massacre of the rev. John Williams —generally called the martyr of Erromango.

NEW HOLLAND, the former name for Australia (q.v.).

NEW INN HALL, OXFORD. This hall, with certain gardens adjoining, was presented to the warden and fellows of New college, by William of Wykeham in 1392. The first principal on record occurs in 1438. During the civil war it was used as a mint for Charles I. It was restored to the purposes of instruction by Dr. Cramer, the late principal, who erected a handsome building for the use of the students.

NEW IRELAND, a long narrow island in the Pacific ocean, lying to the n.e. of New Britain (q.v.), from which it is separated by St. George's channel; lat. 2° 40′ to 4° 52′ s., long. 150° 30′ to 152° 50′ east. Length about 200 m.; average breadth, 12 miles. The hills rise to a height of from 1500 to 2,000 ft., and are richly wooded. The principal trees are cocoas on the coast, and in the interior, forests of areca-palm. The chief products are sugar-cane, bananas, yams, cocoa-nuts. Dogs, pigs, and turtles abound. The natives are apparently of the same race as the inhabitants of Australia; but our information about them is extremely scanty.

NEW JERSEY, one of the original thirteen United States, in lat. 38° 55′ to 41° 21′ n., and long. 73° 58′ to 75° 29′ w., 168 m. long, with a breadth which varies from 59 to 32 m., containing an area of 8,320 sq.m., or 5,324,800 acres; bounded n. by New York, e. by the Hudson river and the Atlantic ocean, s. by the ocean and Delaware bay, and w. by Delaware bay and river, which separate it from Delaware and Pennsylvania. It has 21 counties. The chief towns are Trenton (the capital), Newark, Paterson, Jersey City, Elizabeth, Camden, Hoboken. Its coast line is 120 m., or, including bays, 540 miles. Besides its bordering rivers, the Hudson and Delaware, its principal streams are the Passaic, Hackensack, and Raritan. The northern portion of the state is hilly and mountainous. The Palisades, a wall of perpendicular trap-rocks, from 200 to 500 ft. high, form the western bank of the Hudson river for 15 m., and one of the grandest features of its scenery. The central portion of the state is a rolling country, and the southern and eastern portion a sandy plain declining to the sea. Five geological belts cross the state, containing a sandy pine plain with bog iron ore, shelly marls used for manure, glass sand, green-sand or marl, plastic clay, used in making fire-bricks, metamorphic rocks, argillaceous red sandstone, copper ores, gneiss with specular and magnetic iron ores, red oxide of zinc, and Franklinite iron. Among the most attractive features in the scenery are the falls of the Passaic, the Delaware water gap, and Schooley's mountain. Atlantic city, a bathing-place on the sea-coast, connected by railway with Philadelphia, is a fashionable summer resort. The climate is mild, the soil n. of the pine plains fertile, the country healthy, except the malarious river-bottoms. The agricultural products of the state are wheat, maize, oats, common and sweet potatoes, apples, peaches, plums, grapes, melons, and garden vegetables for the great neighboring markets of New York and Philadelphia. There are cotton and woolen factories, iron-works, extensive manufactories of machinery, locomotives, carriages, glass, boots and shoes, etc. The state draws a large revenue from 1323 m. of railway, and several important canals, connecting

New York and the coal regions of Pennsylvania. There are 4 colleges, normal and free schools, numerous churches, periodicals, and daily papers. The government is similar to those of all the states.

New Jersey was settled in 1620 by Dutch and Swedes. Taken by the English, it was ceded by Charles II. to the duke of York; it was retaken by the Dutch in 1673, and afterwards bought by William Penn and other Friends, who have here numerous descendants. It was the scene of some of the most important military movements of the war of independence, and of the battles of Trenton, Princeton, Monmouth, and Germantown. Pop. in 1840, 373,306; in 1860, 672,031; in 1870, 906,096.

NEW JERSEY (*ante*). One of the original thirteen United States of North America, lying between the Hudson river and the Atlantic ocean on the e., New York on the n., Delaware bay and river and Delaware and Pennsylvania on the w., and Delaware bay on the s., mostly between 39° and 41° n. lat. and meridians 73° 53′ 51″ and 75° 33′ 02″ w. from Greenwich. Its extreme length is 168 m.; greatest breadth, 59 m.; narrowest part, 32 m.; 7,576 sq.m., or 4,849,000 acres; pop. '80, 1,130,892. There are 21 counties: Trenton is the capital; Newark the largest city. The following table shows the growth of the state and the character of its population from 1790 to 1880 inclusive:

Year.	Total population.	Male.	Female.	White.	Colored (free).	Colored (slave).	Native.	Foreign.	Density per sq. m.	Ratio of inc.
1790	184,139	94,188	89,951	169,954	2,762	11,423	......	......	22.12	.....
1800	211,149	108,099	103,050	194,325	4,402	12,422	......	......	25.38	15.10
1810	245,562	125,811	119,744	226,868	7,843	10,851	......	......	29.51	15.86
1820	277,575	140,097	137,478	257,409	12,460	7,557	......	......	33.36	13.04
1830	320,823	163,089	157,734	300,266	18,303	2,254	......	......	38.56	15.58
1840	373,306	188,138	185,168	351,588	21,044	674	......	......	44.87	16.36
1850	489,555	245,346	244,209	465,509	23,810	236	429,176	59,048	58.84	31.14
1860	672,035	335,051	336,984	646,699	25,318	18	549,245	122,790	80.77	37.27
1870	906,096	449,672	456,424	875,407	30,658	None.	717,153	188,943	108.91	34.83
1880	1,130,983	559,823	571,160	......	......	......	......	......	149.27	24.80

By the above table it appears that the ratio of increase of population more than doubled its preceding rate between the years 1840 and 1870, and is now (1880) decreasing. In 1790 it was the ninth state in population; in 1870 the seventeenth.

Topography.—Three ranges of mountains of moderate height traverse the n. part of the state in a direction n.e. and s.w., and all form low links in the Appalachian chain, which merge into the Catskills, the Shawangunk, and the Highlands of the Hudson on the n.e., and are divided from the Allegheny mountains of Pennsylvania by the Delaware river on the s.w. The outcropping rock formations cross the state in bands, in the same n.e. and s.w. direction. The most northerly and highest range of mountains is the Blue or Kittatinny, having a maximum height of 1800 ft. near the New York line, whence it forms an unbroken ridge to "the Delaware water gap." This range has a more rapid ascent on the e. side than on the w., and its summit has a considerable extent of table-lands, naturally well timbered and fertile, under culture. The Kittatinny valley lies between the range just described and the Highland range s.e. of it. It is a valley of great beauty of scenery and agricultural capability, from 500 to 650 ft. above the sea, about 39 m. in length by 10 in breadth. Berkshire, Longwood, and Greenwood Lake valleys are smaller vales of the same general character. The Highland range next s.e. is in many broken mountain ridges and spurs, extending over a width of 22 m. on the n.e. boundary of the state, and narrowing to 10 m. at the Delaware river, where they leave the state. The maximum height of this range is at Rutherford's hill or Hamburg mountain, 1488 ft. above the sea, and Wawayanda mountain, near the New York line, which is 1450 feet. The summer resorts on Schooley's and Musconetcong mountains are on two separate ridges of this range. This range of hills and ridges is generally more abrupt on its s.w. than on its n.e. side. The trap-rock formation which the Hudson river exhibits in its palisades, beginning a few miles above New York, is a dike breaking through a red sandstone formation which approaches the Hudson from the w., turns s. so as to form the palisades, and terminates at Jersey City, near which it has been tunneled by the Erie and the Delaware, Lackawanna and Western railway companies, and cut deep for the passage of the New Jersey Central. West of this ridge of trap rock are what are known as first, second, and third mountains, being the names given to the successive comparatively abrupt ascents from the alluvial levels near New York bay to the mountain ranges before described. Parts of the first rise are known as Orange, Fairmount, and Mont Clair mountains. This portion of the state, geologically a part of the sandstone belt, is one of the richest upland slopes, and has been noted as the northernmost limit of many trees and shrubs of the southern states, which found protection from westerly winds on the e. sides of the hills, with a climate modified by proximity to the sea. Michaux, in his *North American Sylva*, shows that he found a greater variety of trees and shrubs in this locality than in any other part of the northern states. South-west of the Orange mountain range are trap ridges, known as Rocky hill, Ten-Mile-Run mountain, Long hill, Sourland mountain, and Goat hill; and, further n., Round mountain and Pickle mountain, the latter 767 ft. above the sea. All these elevations of trap rock show their most abrupt faces to the e., and slope away gently to the westward. The s.e. part, and nearly two-thirds of the area of the state, has no elevations of any importance; the Neversink highlands, seen from Sandy Hook as one approaches by sea from the e., have a maximum height of 400 feet. They are exceptional elevations in a gently rolling sandy plain which stretches from the sea to the Delaware river, with a slight rise from each towards the center of the state, where the average summit-level is about 160 ft. above the sea.

The state has several distinct drainage basins, which should really be grouped into only two systems. those whose water-shed is to the Atlantic ocean, and those which contribute to the Delaware river and bay. The latter drain more than one-half of the entire state from n. to south. Beginning at the n., on the sea-side slope, an exceedingly narrow strip drains into the Hudson. On the w. side of the palisade dike the Hackensack comes into the state from New York, and flows southwardly through a narrow valley into Newark bay, w. of and parallel with the bay of New York. The Passaic river, next w., has its sources near the center of the northern half of the state, directly w. of New York; flows thence n.e. to its junction with the Pequannock, the Ringwood, and the Ramapo; then e. through a gap in the Highland range, and through Paterson, to its main valley, through which it courses southerly to Newark bay. The Raritan is a larger stream, having its sources directly w. of those of the Passaic, flows southerly within 15 m. of the Delaware river, and then in a generally e. course to its mouth in Raritan bay, s. of Staten island. Its principal tributaries are the Laurington, Millstone, and South rivers. It has the largest and most fertile basin of the Atlantic slope of the state. South of Raritan bay the streams which empty into the sea are small down to Toms river, a stream about 30 m. long, emptying into Toms bay, an estuary from Barnegat bay. Thirty m. s. of that is the Little Egg Harbor river, and 20 m. further s. is Great Egg Harbor river, both draining the southern part of the state from within 15 m. of the Delaware river. The main streams, draining the western slope into the latter river, beginning at the n., are Paulius-kill, Paquest creek, Musconetcong river, emptying about 10 m. below Easton, Penn., and Rancocus creek. Smaller streams are numerous. On the s. the Maurice river drains a considerable area into Delaware bay. One hundred m. of the Atlantic shore, n. of cape May, is a continuous line of harbors and bays, separated from the sea by long stretches of beach, with few inlets on the n. and many on the south. Barnegat bay and Little Egg harbor form a continuous bay more than 40 m. parallel with the sea, with inlets only at the middle and at the s. end. Atlantic City has been built for a summer resort on the outer beach, midway between Little Egg and Great Egg harbors. See ATLANTIC CITY. The extent of inland navigation formed by the bars is about 75 m. from n. to s., but in length of inland shores it is several hundred m. in extent. South of Barnegat bay and Little Egg harbor the inlets are very numerous to these inland channels. The harbors are: Great bay (at the mouth of Little Egg Harbor river), Little bay, Reed's bay, Absecum bay (entered through Absecum inlet just n. of Atlantic City), Lake bay, Great Egg harbor, Peck's bay, Ludlow's bay, Townsend's sound, Style's sound, Leaming's sound, Jenkin's sound, Grassy sound, Richardson's sound, Jarvis sound, and Cape Island sound. The n. shore of Delaware bay is mostly marshy, with no outer sea-beach inclosing harbors and inland passages as on the Atlantic side. See CAPE MAY.

There are many pretty lakes in the northern part of the state. Greenwood lake, in Passaic co., sometimes called Long pond, the largest, lies across the n. boundary, one-half in New York and one-half in New Jersey. It is 8 m. long and 1½ m. in greatest width. In Sussex co. is Culver's, and many smaller ponds. In Morris co. are lakes Hopatcong, 5¼ m. long and 1½ m. wide; Budd's lake, 2 m. long and 1 m. wide; and Green pond, a charming lake, at an elevation of 1044 ft. above the sea, between Green Pond mountain and Copperas mountain, 3 m. long and half a m. wide.

The soils of different parts of New Jersey differ to an unusual degree. On the valleys of the Delaware, the Rapidan, the Passaic, and in many valleys among the mountains of the n. part, the soil is of the best quality. The eastern slope of First, or Orange mountain, which is a red sandstone formation, was remarkable in a state of nature for the variety and strength of its forest vegetation. In general, it may be stated that the central part of the state is the most fertile, and adapted to the greater variety of products. While parts of the alluvial basins are rich enough to bear crops of tobacco, other sections were originally so thin as to have given rise to the expression—"as poor as the barrens of New Jersey." But those sand-barrens, as they were called, have been found well adapted to fruits and vegetable gardening. The average value of farming land in 1870 was $86.14 per acre. The geologic survey of the state has called attention to the oak and pine lands of its southern part. Two-fifths of the area of the state s.e. of the marl belt is divided into two classes: the sands upon which pines alone thrive, and those which grow oak as well as pine, which have more clay and humus. The white-oak bottoms are the best parts of the latter. The oak lands have been found particularly susceptible to improvement, and are showing good crops of grains as well as fruits since intelligent industry has been applied to them.

Geology.—The bands of geological outcrop cross the state from n.e. to s.w. The azoic (granite, crystalline limestone, and gneiss) and the paleozoic (sandstone, fossiliferous limestones, shales, and slates) are interlaced in the formation of the extreme n.w. part of the state. The Highland range, of which Morristown may be considered at the center of the belt, is mostly underlaid with the azoic rocks, though the paleozoic are not unfrequently seen outcropping in the valleys. The triassic formation, in which the red sandstone is broken by irruptions of trap and basalt, occupies a broad belt running from n.e. to s.w. across the state s.e. of a line drawn from Jersey City to Trenton. This is the most fertile section of the state. The cretaceous formation, including the greensands, chalks, marls, plastic clays, and mixture of marls, clays, and sands, forms a band s.e. of the sandstone belt, extending from Raritan bay to the head of Delaware bay. The remainder of the state s.e. is of the tertiary and drift formations of sands, gravel, loam, and marls. The state's geologic surveys have been quite exhaustive. Prof. Henry D. Rogers made the first in 1839–40; the second was undertaken by Dr. Wm. Kitchell in 1854; the third by prof. George H. Cook, state geologist, was begun in 1864, and has been continuous since. A volume, entitled the *Geology of New Jersey*, embraced the results of surveys up to 1868, since which time annual reports have been published.

Mineralogy and Geologic products.—The azoic and paleozoic formations of the n.w. part furnish magnetic iron ores in many places in Sussex, Warren, Morris, and Passaic counties; the product in 1873 amounting to 665,000 tons. The greater portion of this ore is sent to the furnaces of Pennsylvania, near the coal supply. About one-fifth of it is worked up by the local blast-furnaces at Ringwood, Boonton, Stanhope, Oxford furnace, and Phillipsburg. In 1874 there were 214 iron mines of magnetic ores; 12 mines of red and brown hematite ores worked on a large scale; besides mines of bog-iron worked here and there on a small scale. Copper ores have been found and worked in Somerset co., but have not proved remunerative. Zinc ores have been found in two places in Sussex co., said to supply $\frac{7}{10}$ of the zinc oxide and $\frac{1}{5}$ of the metallic zinc product of the United States. In 1868, according to prof. Cook, 25,000 tons of zinc ores were taken out in that county, since which time there has been a falling off. Lead ore is often found, but has not been of a profitable grade to work; nickel also has been found. Graphite, or plumbago, has been mined with profit in several places in Morris and Passaic counties. Sulphate of baryta, manganese, and iron pyrites are mined and used in the manufacture of sulphuric acid, and greensand and other sands for glass-making and chemical uses are drawn from many parts. Mineralogists enumerate upwards of 160 minerals which are found in the state. The proximity of the mineral regions of New Jersey to the great city of New York brings all its mineral wealth into convenient use, and gives it high value. The geologic products of highest value to the state are its extensive deposits of pure marl, clay marl, and shell marls, used in connection with other fertilizers; for on these have depended the improvement of millions of acres of its soil, large portions of which were formerly considered too poor to cultivate, but are now made productive beyond the average per acre of any state in the union. These marls will probably be the means, in connection with the excrements of the great neighboring cities, of making New Jersey, in soil, one of the richest, instead of one of the poorest states. Upwards of 200,000 tons of marl were used annually before 1875. The quantity now used must be double that. Lime is quarried in vast quantities for burning to make into quick-lime for mortar, and also for fertilizing. Porcelain and potter's clays of excellent quality, found in the state, are used in manufacturing, to the amount of 300,000 tons annually. Kaolin also is found in large deposits, though much of it is not of superior quality. Morris co. furnishes infusorial earths, used in the manufacture of dynamite and giant powders, and for polishing purposes, and sand valuable for molding purposes and to enter into the composition of fire-brick for reverberatory furnaces. Burlington co. also supplies these sands. A pure white sand of the finest quality, for glass-making, is found in s. New Jersey, and used in the glass-works of Glassboro and Millville. The variety of building stones furnished by the quarries of New Jersey is great, and includes fine granite, or gneiss-granite, sandstones of a variety of tone and quality, limestones (including water-lime and some marbles), bluestone, trap-rock, slates, fire stones, and conglomerate, altogether providing the great cities around New York bay with a large part of all their building and paving-stones. Trinity church in New York is an example of brown sandstone from the New Jersey quarries.

Climate.—Proximity to the Atlantic on its whole eastern and southern parts, and its generally low surface above the sea, give New Jersey a climate of less extreme cold than the states inland in the same latitude, but not less extreme heat. The southern counties, however, surrounded by sea waters, show less range between extremes than other portions of the state. Where fresh water joins the sea the marshes are malarious, and there are some portions of the lands overlying the trap-rock dikes where water settles into fissures below the surface and gives rise to malarial diseases. The very rich alluvial lands of the Delaware were formerly more subject than any other portions of the state to the same class of ailments, but in general have long since become quite as healthful as the average of lands. As a whole the state is eminently healthful, and the sandstone belt is considered particularly favorable to persons inclined to lung disease. The following table of thermometric and barometric observations gives the climate of Newark, which may be taken as representing the average of the state:

Mean temperature, year (F.)	51°.25
Highest “ “ “	98°.5
Lowest “ “ “	12°.5
Range of “ “ “	110°
Mean “ spring, “	48°.48
Highest “ “ “	85°.50
Lowest “ “ “	15°.20
Range of “ “ “	70°.30
Mean “ summer, “	70°.40
Highest “ “ “	98°.50
Lowest “ “ “	48°.80
Range of “ “ “	49°.70
Mean “ autumn, “	54°.80
Highest “ “ “	84°
Lowest “ “ “	22°

Range of temp'ture, autumn,(F.)	62°
Mean “ winter, “	28°.90
Highest “ “ “	59°
Lowest “ “ “	12°.50
Range of “ “ “	71°.50
Rain fall, year..................	54.73 in.
“ “ spring months........	13.52 “
“ “ summer “	24.12 “
“ “ autumn “	7.79 “
“ “ winter “	9.30 “
Barometer, annual mean.......	30.098 “
“ mean spring.......	29.990 “
“ “ summer	29.997 “
“ “ autumn......	30.024 “
“ “ winter.......	30.089 “

Industries—Agriculture and Horticulture.—The value of the farm and garden lands, with their implements, in 1870, was returned at $265,411,367; and the total value of the products of that year at $42,725,198. The record of quantities and values of market-garden products is necessarily very imperfect. The immense orchard products of the state, especially peaches, also are not likely to be fully stated in any official reports. The value of market-garden products in 1870 was reported, $2,978,250; that of orchard products at $1,295,282. The following table of grain products is from the report of the U. S. commissioner of agriculture for 1878:

GRAIN AND HAY CROPS OF 1878, AS SHOWN BY REPORT OF AGRICULTURAL BUREAU, WASHINGTON.

	Bushels.	Average per acre.	Number of acres.	Value per bush.	Total valuation.
Indian Corn....	9,792,000	36	272,000	$0.45	$4,406,400
Wheat	2,497,500	15	166,500	1.06	2,647,350
Rye	564,740	15.1	37,400	60	338,804
Oats	5,224,800	31.1	168,000	29	1,515,192
Buckwheat	374,300	19	19,700	54	202,122
Potatoes	4,344,000	80	54,300	87	3,779,280
	Tons.	Tons.		Per ton.	
Hay	681,500	1.45	470,000	10.77	7,339,755
Total acreage and values	....	....	1,187,900	......	$20,228,943

The following table from the same report exhibits the live stock in 1878:

	Number.	Average price.	Value.
Horses	114,500	$85.03	$9,735,935
Mules	14,400	104.27	1,501.488
Milch cows	152,200	35.46	5,397,012
Oxen and other cattle	84,500	28.78	2,431,910
Sheep	127,000	3.78	480,060
Hogs	152,900	6.84	1,045,836
Total	645,500	......	$20,592,241

The amount of milk sold from New Jersey in 1870 was 5,373,323 gallons, which at 20 cents per gall. would give a value $1,074,664. Butter, 8,266,000 lbs.; value, $2,066,506. The cranberry harvest the same year was estimated worth $358,000. Sweet potatoes are grown to a large extent, the sandy lands of the state being the most northerly section of the country in which they are grown with profit. The fisheries on the coast, especially of oysters, are a prolific source of wealth, and return nearly half a million dollars annually in value. The state has a board of fish commissioners, who are engaged in stocking its fresh-water streams and upland lakes from their hatcheries. They reported for 1878 58,000 landlocked salmon and 2,500 black bass put into the lakes; 1,665,000 put in the Delaware river; 500,000 California salmon and 243,000 brook trout hatched and partially distributed; and 100,000 white fish hatched and not distributed. The work of this year indicates the result intended. A board of riparian commissioners have charge of the interests of the state in lands under tide-water.

Manufactures.—In 1870 New Jersey ranked seventh among the states in the value of her manufactures. The number of establishments was 6,636, and of employees 75,552; of whom 58,115 were men, 11,198 women, and 6,239 children. The capital supposed to be invested was $79,606,719, which would represent an average of $12,000 capital to each establishment. The wages then paid annually were $32,648,409, equal to an average of $432 per annum for each employee. This was at a period of highest prices for everything. The value of raw materials used was $108,415,245, and of the products of the year $169,237,732. The following are among the products greatest in value of these manufactures: The refining of sugars and molasses, $11,199,740; flouring mills, $10,557,070; iron and its rough products, $13,611,271; machinery, $8,818,123; leathers, $9,807,948; hats and caps, $5,007,270; cotton and woolen printed goods, $5,005,997; silk threads and fabrics, $4,527,644 (which increased in 1874 to $6,097,692, and will probably reach a far higher figure by the census of 1880); bleaching and dyeing, $4,889,695; cotton goods, thread, and yarn, $4,065,228; trunks, valises, and satchels, $3,798,000; clothing, $3,346,125; jewelry, $3,315,679; glass, window, and hollow ware, $2,805,726; boots and shoes, $2,830,322; liquors, malt and distilled, $3,674,218; carriages and wagons, $2,281,643; india rubber and elastic goods, $2,224,839; sash, doors, and blinds, $2,160,795; woolen and worsted goods, $2,415,805; lumber, planed and sawed, $3,097,891; paper of all kinds, $1,863,321; saddlery and harness, $1,732,305; brick, $1,695,580; tin, copper, and sheet-iron ware, $1,667,020; soap and candles, $1,606,234; steel, cast, and springs, $1,847,887; hardware, $2,182,395; paints, lead and zinc, $1,203,082; stone and earthenware, $1,106,985; bakery products, $1,203,082. Quarry products, a very important item, are not returned. Of all the manufactures of New Jersey, it is probable that those of silk and iron will show the largest increase by the census of 1880, and that the annual products of most factories will be more largely increased than their values.

Commerce.—The metropolis of New York is the great port of entry of the United States, and still more exclusively of the state of New Jersey; so that the foreign commerce of the state shows as a part of the customs business of that city, and its commercial relations with other states of the Union also appear in the statistics of the imports, exports, and sales of the city of New York. The custom-house districts of Perth Amboy, Newark, Little Egg Harbor, Great Egg Harbor, Burlington, and Bridgeton therefore show imports and exports of less than $100,000. The number of foreign vessels entered and cleared in 1874 was but 61, amounting to 9,707 tons—or less than 160 tons each; American vessels 35, tonnage 6,048, averaging 173 tons each. At the same time the registered, enrolled, and licensed tonnage belonging in New Jersey custom districts, June 30, 1874, was 1196 vessels, aggregating 102,100 tons. Of these 90 were steamers, representing 17,518 tons. Built in 1874, 75 vessels; aggregate tonnage, 8,801. While these figures are insignificant compared with the real share which the products and the capital of New Jersey have in foreign and coastwise commerce, railroads, on the other hand, bear across the state an immense commerce between the great cities of New York and Philadelphia and the country at large. By the returns in 1878, 58 railway companies have charters from the state, representing 1652 m. of road. Twenty-three are operated by their own boards; the other 35 are leased by seven railway corporations. A general law for the incorporation of railway companies was passed in April, 1878, doing away with special charters and monopolies in the future. The capital in railways and equipments in the state in 1875 was $156,324,108. The horse railways of the larger cities of the state, with their equipments, represented a capital of $1,550,000, managed by five companies.

Canals.—The canals of New Jersey were once its principal commercial channels. The Morris and Essex canal, 101 m. long, from Jersey City to the Delaware river at Phillipsburg, was built before the Erie canal of New York, and has always transported vast quantities of coal from Pennsylvania to New York. By its corporation charter it was invested with banking powers, or, rather, its corporators assumed such powers from the indefinite range of the powers granted. It cost originally £2,825,997. The Delaware and Raritan canal, from New Brunswick to Bordentown, 43 m. long, with a feeder to Trenton 22 m., was built in the beginning of the present century, at a cost of $3,935,287. It is under lease to the united railroad and canal companies of New Jersey.

Education.—The children of school age (5 to 18 years) enumerated in 1875 were 298,000; the enrolled children of the public schools, 186,392; average attendance, 96,224; number attending private schools, 36,507; attending no schools, 71,895. The public school buildings provide places for 155,152. The number of school districts is 1369; number of public school buildings, 1493. Of 354 private schools, 101 are sectarian and 253 unsectarian. Fund raised by tax for public schools in 1875, $2,272,825; from other sources, $31,573; total, $2,304,398. Teachers employed, 3,216, of whom 960 were men, and 2,256 women; average monthly salary of men, $65.77; of women, $38. Value of public school buildings and realty, $6,000,732. The cities have a distinct organization of their schools under the control of city superintendents, who, however, are subject to the state laws and the direction of the state superintendent of education. Each county has a superintendent, and teachers' institutes had been organized in 18 of the 21 counties. The state normal school for teachers, at Trenton, embraces a system of model schools in which the students are trained in the respective departments of school teaching. The Farnham preparatory school at Beverly prepares students to enter the normal school, or for the practice of business. The numbers in attendance at the normal school in 1874 were 35 men and 234 women, under 12 teachers. The model school, under the charge of the students in the normal, contained 443 pupils, of whom 175 were boys and 268 girls. In 1879 an act passed the legislature for the establishment of schools for industrial education. The annual school tax on all the property of the state is two mills on a dollar, which yielded in 1876, $1,238,115. In addition to the fund raised annually by this tax

New Jersey has a school fund valued in 1876 at $2,208,680, of which $1,214,333 was invested in securities, $238,000 due from the state fund, and the remainder in the form of grants or leases of land. For higher education there are 4 colleges, 4 collegiate schools for women, 3 scientific schools, including the state agricultural and scientific college connected with Rutgers, and 4 theological schools, besides many private seminaries for the instruction of youth of both sexes in the higher courses of study. The colleges are: the Burlington (Episcopal) at Burlington, founded in 1846, which has 7 professors, 65 students, income $15,000, and a library of 2,000 volumes; the Rutgers (q.v.) (Reformed) at New Brunswick, founded in 1770; the Princeton (Presbyterian) at Princeton, chartered as the college of New Jersey (q.v.) in 1746; the Seton Hall (q.v.) (Roman Catholic) at South Orange, chartered in 1856, employs 32 professors or teachers, with 105 students, and has a library of 8,000 volumes; the Bordentown female college at Bordentown, founded in 1851, has 8 teachers, 104 students, and $30,000 invested in buildings; the Ivy Hall college for women at Bridgeton, founded in 1861, has 9 teachers, 60 students, $20,000 in buildings, $14,000 income, and 1000 volumes in library; St. Mary's Hall (Episcopal), Burlington, founded in 1837, has 28 professors and teachers, 200 students, 2,000 volumes in library; the Pennington female collegiate institute at Pennington, founded in 1840, has 9 teachers, 181 students, $100,000 in buildings, and a library of 2,000 volumes. The schools or colleges of science are: the Stevens institute of technology (q.v.) at Hoboken, founded in 1871; the scientific school of Rutgers institute (including the state agricultural and scientific college) at New Brunswick, founded in 1864, has 11 professors, 62 students, $116,000 endowment, and a library of 8,800 volumes; the John C. Greer school of science at Princeton (q.v.), founded in 1873. Most of the above colleges have preparatory schools connected with them. The Peddie institute at Hightstown is a high grade seminary founded in 1864, and has 7 teachers, 85 students, $150,000 invested in buildings, and $19,000 income. New Jersey is rich in theological institutions. At Princeton is the theological seminary of the Presbyterian church, founded in 1812, which has 7 professors, 116 students, $200,000 in buildings, $450,000 endowment, $29,000 income, and 26,000 volumes in its library; the seminary of the Reformed church in America at New Brunswick, founded in 1784, has 5 professors, 38 students, $300,000 in buildings, $220,000 endowment, $12,500 income, and 20,000 volumes; the Drew theological seminary (q.v.) (Methodist) at Madison, founded in 1867; and the German theological school of Newark presbytery at Bloomfield, founded in 1869, with 6 professors, 23 students, $30,000 in buildings, $20,000 endowment, and $700 income. Of churches and their adherents the following table presents a synopsis for 1874:

NAME OF SECT.	Number of organizations.	Church buildings.	Ministers and priests.	Communicant members.	Adherent population.	Value of church property.
Baptist	169	169	178	28,296	117,000	$2,843,500
Free Will Baptist	5	4	4	412	2,000	25,450
Christian	12	10	8	840	3.900	58,000
Congregational	20	20	28	2,558	10,000	483,600
Episcopal	129	126	144	12,116	54,000	2,637,000
Friends	65	65	none.	5,850	20,000	480,500
Jew	2	2	3	300	1,500	23,500
Lutheran	28	25	21	2,951	9,000	146,450
Methodist	523	519	383	71,481	285,000	5,846,000
Moravian	4	4	5	478	1,725	18,300
New Jerusalem	6	4	6	300	1,500	6.500
Presbyterian	257	257	359	40,098	200,000	3,873,050
Reformed (Dutch)	120	121	146	18,640	28.000	2,953,760
Reformed (German)	8	7	5	750	3,550	21,400
Roman Catholic	147	115	125	....	140,000	1,780,000
Spiritualist	2	2	...	....	4,000	4,500
Unitarian	1	1	1	....	350	11,000
Universalist	4	2	3	....	1,000	105,000
Union	2	2	2	150	750	5,000
Totals	1,504	1,455	1,421	185,160	943,275	$19,043,510

The journals published in the state are as follows: Dailies, 22; tri-weekly, 1; semi-weekly, 2; weekly, 146; bi-weekly and monthly, 2; total, 178. Politically these are classified: 49 in sympathy with the democratic party, 53 with the republican party, 4 national or "greenback," and 63 independent of party affiliations. One weekly and 1 monthly are devoted to the cause of temperance, 2 weekly to mechanical information, 1 monthly to literature alone, 1 monthly to law, and 1 bi-weekly and 2 monthlies to college matters. Of these, 1 daily, 2 semi-weeklies, and 9 weeklies are in the German language. The aggregate subscription to these papers varies from 200,000 to 300,000 per year, and the total number of copies circulated annually exceeds 20,000,000.

History and Government.—The date of the first settlement is not certainly known. Dutch traders are believed to have occupied Bergen point between 1614 and 1620. On the e. bank of the Delaware a party of Dutch under Cornelis Jacobson Mey and Adriaen

Jarisz built a fort 4 m. below Philadelphia in 1623, and called it fort Nassau. The king of England, in 1634, granted the whole region along the Delaware to sir Edward Ployden under the name of New Albion, and in 1638 Swedes and Finns purchased lands of the natives and settled on the river. The Dutch and Swedes prevented the English from getting a foothold, however, until 1655, when Peter Stuyvesant from New Amsterdam (New York) drove out the Swedes, or forced them to acknowledge Dutch rule. In 1664 Charles II. assumed sole jurisdiction, and granted all the country between the Delaware and Connecticut rivers to his brother, the duke of York, who took possession of New Amsterdam with a force sent out under col. Richard Nichols, who soon after made land grants w. of New York bay to colonists from New England, who began the settlements at Newark, Elizabeth, Middletown, and Shrewsbury. The next year the duke of York assigned his grant to lord Berkeley and sir George Carteret, who named the region New Jersey in compliment to the isle of Jersey, where Carteret had been the king's governor. Elizabeth was made the seat of government in 1665, and Philip Carteret was the first governor of New Jersey. He was not liked, and had trouble with the colonists about land rents. He went to England in 1670, returned soon afterwards, and continued governor till 1674, when the Dutch recaptured New Amsterdam, and the adjacent country fell into their hands. But Great Britain regained possession by treaty the same year. The conflicting claims of grantees of lands from Nichols and from Carteret were settled by the king, who confirmed all grants to his brother and Carteret. But the duke had made a conveyance to sir Edmund Andros, governor of New York, who assumed the power to control the government in New Jersey also; and in April, 1680, imprisoned Carteret. The duke of York interceded in behalf of the grantees under Nichols and New Jersey's governor, and in 1681 they were settled in their rights. In the meantime (1673) William Penn with other Quakers had bought Berkeley's interest in New Jersey, and in 1675 had established a Quaker settlement at Salem, in the southern part of the state. One Fenwick seems to have exercised jurisdiction in s. New Jersey after the settlement at Salem, up to a line drawn from Little Egg Harbor to lat. 41° on the Delaware, while all of Jersey n.e. of that line remained under the gubernatorial rights of Carteret. In Feb., 1682, William Penn and 11 other friends purchased the whole territory. In 1668 a legislative assembly had convened at Elizabeth, and passed criminal laws of excessive severity. Another was convened in 1675. Robert Barclay, a Scotchman, one of the associate purchasers, was the first governor under the new ownership in 1682. Respect for the rights of the settlers and a peaceful and wise administration gave New Jersey 20 years of prosperity. But the company-proprietorship of so large a country was found to have such disadvantages that in 1702 the proprietary rights of the purchasers were ceded back to the crown, and the same year queen Anne appointed lord Cornbury governor of New York and New Jersey; but each colony continued to have its separate assembly. In 1708, on the petition of the colony to have a separate administration, Lewis Morris was made governor of New Jersey, which then had a population of 40,000. The growth of New Jersey was peaceful until the beginning of the revolution. The last royal governor was William Franklin, son of Benjamin Franklin, who was appointed in 1763, and was noted as a bitter tory. New Jersey, through her legislature, entered cordially into the measures for the defense of colonial rights against the oppressive legislation of the mother country, and on July 2, 1776, anticipating the declaration of independence by the continental congress, adopted a state constitution, which was ratified on the 18th, and which continued as the organic law until 1844, when another was adopted. On June 25, 1776, governor Wm. Franklin, who had set himself against the action of the legislature, was deposed, placed under guard, and sent to Connecticut a prisoner. William Livingston was elected governor Aug. 13, 1776, and re-elected for 14 years. The important battles of Trenton, Princeton, and Monmouth are historical mementoes of New Jersey's part in the war for independence. Her position in the center of the confederacy made her soil the principal theater of war. Trenton was made the state capital in 1790. The constitution of 1776, which was superseded by another Aug. 13, 1844, was again materially modified by a commission of 14 in 1873, whose work was approved by the legislature in 1874, and again in 1875, and ratified by the people by an immense majority the latter year at a special election. The following is a list of New Jersey's governors since the state organization: William Livingston, 1776–90; William Patterson, 1790–94; Richard Howell, 1794–1801; Joseph Bloomfield, 1801–12; Aaron Ogden, 1812–13; William S. Pennington, 1813–15; Mahlon Dickerson, 1815–17; Isaac H. Williamson, 1817–29; Peter D. Vroom, 1829–32; Samuel L. Southard, 1832–33; Elias P. Seeley, 1833; Peter D. Vroom, 1833–36; Philemon Dickerson, 1836–37; William Pennington, 1837–43; Daniel Haines, 1843–44; Charles S. Stratton, 1844–48; Daniel Haines, 1848–51; George T. Fort, 1851–54; Rodman M. Price, 1854–57; William A. Newell, 1857–60; Charles S. Olden, 1860–63; Joel Parker, 1863–66; Marcus L. Ward, 1866–69; Theodore F. Randolph, 1869–72; Joel Parker, 1872–75; Joseph D. Bedle, 1875–77; George B. McClellan, 1877–81; George C. Ludlow, 1881. The legislative assembly consists of a senate and a general assembly. One senator is elected from each county for three years, making 21 members. The assembly is limited by law to 60 members, elected annually, and represents districts apportioned by population after each national census. The governor is elected for three years. The treasurer and comptroller are elected by the legislature for three years. The attorney-general.

secretary of state, superintendent of schools, prosecuting officers, and clerk of the supreme court are appointed by the governor, subject to the approval of the senate.

Judiciary.—The distinction between courts of law and courts of equity is still maintained in New Jersey. All judges are appointed by the governor for a term of six years, subject to confirmation by the senate. The first, or lower courts, are the county courts of common pleas and oyer and terminer, consisting of not more than five judges; an orphan's court, and court of general quarter sessions of the peace. Next above is the supreme court, which makes the circuit of the state, and is composed of a chief-justice, and four associates. A prerogative court is presided over by the chancellor alone. The court of errors and appeals in the last resort is composed of the chancellor, the justices of the supreme court, and six judges. The pardoning power is vested in the chancellor, 6 judges, and the governor; but is not exercised without the sanction of the governor.

Charitable Institutions.—There is a state board of charities, a part of whose duties is to visit the state institutions, those of the counties, and private incorporate benevolences. Care and instruction to the deaf and dumb is provided out of the state at New York and Buffalo at the state institutions of New York, for which in 1876 $25,000 was paid. The blind are taken care of in New York and Pennsylvania institutions at a cost of about $14,000 per annum. Idiocy and insanity are greatly on the increase. The total number of insane, idiots, and epileptics for 1878 was 9,501: mortality among them, 706. Idiots and the feeble-minded are sent to the training school at Media, Penn., at an annual cost of about $8,000. The home for disabled soldiers is maintained at an annual cost of from $40,000 to $50,000. The home for soldiers' children, formerly maintained, has been closed, after having executed its trust in educating and providing homes for them. An act for the establishment of orphan asylums was enacted Mar. 9, 1877, providing that any five or more persons may form themselves into an orphan-asylum association for the purpose of receiving, supporting, and educating orphan children, under such name as they may choose, after being duly incorporated under the further provisions of the act. Such private associations are believed to be a more efficient means of providing for the orphans in each locality than state institutions. An industrial school for girls at Trenton is maintained by the state. A state reform school for juvenile delinquents is located at Jamesburg in Middlesex co., on a farm of 490 acres, where the boys are employed at farm labor and taught a few trades. The old state lunatic asylum is at Trenton. The number of patients in 1877 was 510 and its expenses the same year $37,807. The state pays $1 per week for every county patient in addition to what each country is obliged to pay for those it sends. The institution derives a revenue from the care of private patients who are sent to it. The new asylum for the insane at Morristown is one of the finest structures for the purpose in the country, having recently been finished at a cost of about $650,000. It will accommodate upwards of 800 patients. In 1877 it maintained 445, at a cost of $26,441. The financial condition of the charitable institutions reported in 1879 is as follows:

Valuation of real property	$28,415,509
Valuation of personal property	5,561,253
Total	$33,976,762
Receipts—Cash balance from preceding year	448,809.44
Received from the state	1,047,969.36
Received from cities	8,510,217.16
Voluntary donation	793,337.02
From all other sources	2,109,457.74
Total	$7,909,791.22
Expenditures for buildings and improvements	820,778.67
For supervision and maintenance	6,587,975.04
Total	$7,404,758.71
Charity institutions, credit balance, 1879	$501,037.51

The state prison is at Trenton. Its average number of convicts is 815. The earnings and income of 1877 amounted to $75,611; the expenditures to $123.148. The earnings of the convicts exceeded the expense of their keeping that year by $12,129. In 1879 the legislature appointed a special committee to prepare a report on the questions of prison labor and its relation to other labor, which it is supposed will be the basis of the future prison policy of the state.

Finances.—The outstanding debt of the war loan, originally about $2,500,000, was reduced by 1878 to $2,196,300; $100,000 is required to be paid annually. Of this, the sinking fund, which has increased to $1,458,852, pays $10,000 per annum, besides paying the interest on the entire debt; leaving $90,000 to be raised annually by taxes. In a few years the sinking fund will pay the whole annual reduction required. All the state's floating debt was paid off in 1878, leaving a balance in the treasury of $120,000. The general fund state tax is one mill on the dollar valuation; the school tax, two mills on the dollar. The state taxes are low, but the county taxes and the municipal taxes of many of the cities have been ruinously high, being on an average about eight times as much as state and school tax combined; as the following table will show:

CITIES IN 1878.	RATES OF TAXATION PER $1000.				Total rate of taxation on $1000.
	City purposes.	County purposes.	State, school.	State, general.	
Newark	$12.60	$4.20	$2.00	$1.00	$19.80
Paterson	15.40	3.76	2.23	1.11	22.50
Jersey City	17.00	4.00	1.74	86	23.60
Hoboken	12.27	3.24	2.04	1.02	18.57
Rahway	22.05	4.16	2.13	1.07	29.61
Elizabeth	28.40	4.00	2.13	1.07	35.60
Trenton	8.30	3.70	2.00	1.00	15.00
Camden	15.00	5.00	2.00	1.00	23.00
New Brunswick	19.80	5.87	2.22	1.11	29.00
Orange	......	......	......	......	......

ELECTORAL AND POPULAR VOTES FOR PRESIDENT AND VICE-PRESIDENT.

Year.	Candidates for whom the electoral vote was cast.	Electors.	Popular vote.	Candidates of the opposition.	Popular vote.	Third party candidates.	Popular vote.
1788..	George Washington, P. John Adams, V.P. John Jay, V. P.	6 1 5	Data wanting.	Previous to the election of 1804 each elector voted for two candidates for Pres.; the one receiving the highest number of votes, if a maj., was declared elected pres., and the next highest vice-pres.	Data wanting.	......	......
1792..	Geo. Washington, P. John Adams, V.P.	7	"		"	......	......
1796..	John Adams, P. Thos. Pinckney, V.P.	7	"		"	......	......
1800..	John Adams, P. C. C. Pinckney, V.P.	7	"		"	......	......
1804..	Thomas Jefferson, P. George Clinton, V.P.	8	"	Charles C. Pinckney, P. Rufus King, V.P.	"	......	......
1808..	James Madison, P. George Clinton, V.P.	8	"	Charles C. Pinckney, P. Rufus King, V.P.	"	......	......
1812..	De Witt Clinton, P. Jared Ingersoll, V,P.	8	"	James Madison, P. Elbridge Gerry, V.P.	"	......	......
1816..	James Monroe, P. D. D. Tompkins, V.P.	8	"	Rufus King, P. John E. Howard, V.P.	"	......	......
1820..	James Monroe, P. D. D. Tompkins, V.P.	8	"	John Quincy Adams, P. Richard Stockton, V.P.	"	......	......
1824..	Andrew Jackson, P. John C. Calhoun, V.P.	8	10,985	John Q. Adams, P. N. Sandford, V.P.	9,110	W. H. Crawford, P. Nath'l Macon, V.P.	1,196
1828..	John Q. Adams, P. Richard Rush, V.P.	8	23,758	Andrew Jackson, P. John C. Calhoun, V.P.	21,950	No 3d party candidates	......
1832..	Andrew Jackson, P. M. Van Buren, V.P.	8	23,856	Henry Clay, P. John Sargent, V.P.	23,393	William Wirt, P. Amos Ellmaker, V.P.	no report.
1836..	Wm. H. Harrison, P. Francis Granger, V.P	8	26,132	Martin Van Buren, P. R. M. Johnson, V.P.	25,572	Hugh L. White, P. John Tyler, V.P.	1,585
1840..	Wm. H. Harrison, P. John Tyler, V. P.	8	33,351	Martin Van Buren, P. R. M. Johnson, V.P.	31,034	No 3d party candidates	......
1844..	Henry Clay, P. T. Frelinghuysen, V.P	7	38,313	James K. Polk, P James M. Dallas, V.P.	37,495	James G. Birney, P.	no report.
1848..	Zachary Taylor, P. Millard Fillmore, V.P	7	40,015	Lewis Cass, P Wm. O. Butler, V.P.	36,901	Martin Van Buren, P Chas. F. Adams, V.P.	849
1852..	Franklin Pierce, P. William R. King, V.P.	7	44,305	Winfield Scott, P. Wm. A. Graham, V.P.	38,556	John P. Hale, P. Geo. W. Julian, V.P.	350
1856..	James Buchanan, P. J. C. Breckenridge VP	7	46,943	John C. Fremont, P. Wm. M. Dayton, V.P.	28,338	Millard Fillmore, P. A. J. Donelson, V.P.	24,115
1860..	Abraham Lincoln, P. Han. Hamlin, V.P.	4	58,324	Stephen A. Douglas, P H. V. Johnson, V.P.	62,801 Three elect'l votes.	John Bell Edward Everett J. C. Breckenridge Joseph Lane	no report.
1864..	Geo. B. McClellan, P. G. H. Pendleton, V.P.	7	68,020	Abraham Lincoln, P. Andw. Johnson, V.P.	60,723	No 3d party candidates	......
1868..	Horatio Seymour, P. F. P. Blair, Jr., V.P.	7	83,001	Ulysses S. Grant, P. Schuyler Colfax, V.P.	80,121	No 3d party candidates	......
1872..	Ulysses S. Grant, P. Henry Wilson, V.P.	9	91,661	Horace Greeley, P. B. Gratz Brown, V.P.	76,801	Charles O'Connor	630
1876..	Samuel J. Tilden, P. T. A. Hendricks, V.P.	9	115,962	R. B. Hayes, P. Wm. A. Wheeler, V.P.	103,517	Peter Cooper, P	714
1880..	W. S. Hancock, P. Wm. H. English, V.P.	9	122,565	James A. Garfield, P. C. A. Arthur, V.P.	120,555	James B. Weaver, P. B. J. Chambers, V.P.	2,617

It will be seen that New Jersey cast her electoral votes for presidents Washington and John Adams; against Jefferson for his first term in 1800, and for him the second in 1804; for Madison's first term in 1808, and against his second in 1812; for James Monroe both terms, 1816–20; against John Quincy Adams in 1824, when he was elected, and for him in 1828, when Andrew Jackson was elected; for Jackson's second term in 1832; against Van Buren in 1836, when he was elected, and for him in 1840, when Harrison was elected; against Polk in 1844; successively for the presidents-elect Pierce, Buchanan, and Lincoln, in '52, '56, and '60; against Lincoln's second term; against Grant in '68, and for him in '72; against Hayes in '76; and against Garfield in '80.

NEW JERSEY, COLLEGE OF, founded through the exertions of some leading members of the synod of New York—which then included many of the Presbyterian churches in New Jersey—under charters granted, 1746, by acting governor Hamilton, and, 1748, with more liberal provisions by governor Belcher. It was opened, 1747, at Elizabethtown; was removed to Newark, and thence to Princeton, where a large college building was erected and named Nassau hall, in honor of William III. of the house of Nassau. This building was used as a barrack and hospital by both American and British soldiers during a part of the revolutionary war. At the battle of Princeton, the British troops made a stand within its walls, and were driven out by Washington's advance. The continental congress met in it in 1783, and attended the commencement of that year in company with Washington, who presented 50 guineas to the trustees to aid in repairing the damages occasioned by the battle. The money was used for a full-length portrait of Washington—painted by the elder Peale—to fill the vacancy in a large gilt frame, hanging in the prayer-hall, from which the portrait of George III. had been shot away by a cannon ball during the assault. Jonathan Dickinson was the first president, Jonathan Edwards the third, Dr. Witherspoon—a member of the continental congress, and a signer of the declaration of independence, the fifth; Dr. Maclean, the tenth, yet lives, venerable in years and honored for his lifelong efficient and varied service in the college. Dr. James McCosh, from Queen's college, Belfast, Ireland, the present head of the institution, elected 1868, has greatly advanced its interests by his distinguished reputation, able instructions, and skillful administration. During his presidency the faculty has been enlarged, and the number of students greatly increased; commodious and elegant buildings have been erected, new studies introduced, the school of science established, and more than $2,200,000 contributed for various objects designed to increase the efficiency of the college. Of this sum $1,356,000 was given by Mr. John C. Green and by his legatees, since his death, in carrying out his wishes. Among the other large donors are Messrs. N. N. Halstead, Robert Bonner, Henry G. Marquand, William Libby, R. L. and A. Stuart, James Lennox, and John J. Blair. The college year is divided into three terms. A part of the very complete curriculum of studies is elective during the junior and senior years. There is a large number of prizes, scholarships, and fellowships, the winners of the last are required to pursue a prescribed course of study for one year after graduation. The faculty consists of the president,—who, in addition to his charge of some other departments of instruction, is professor of Biblical instruction,—21 other professors, with 13 tutors and other instructors. During the current year, 1880-81, there are 7 fellows, 39 post-graduates, 93 seniors, 90 juniors, 106 sophomores, 89 freshmen, 56 in the school of science, and 11 "specials;" making a total of 491. The American whig and Cliosophic literary societies have for more than a century added greatly to the fame, attractive power, and usefulness of the college. The college and society libraries contain nearly 50,000 volumes. The whole number of graduates is more than 5,000, among whom have been many distinguished and useful men both in church and state. The campus forms a large quadrangle, fronting on the main street of the town, and is ornamented with many fine and venerable trees. The principal buildings are Nassau hall—twice ravaged by fire and rebuilt, East and West colleges, Whig and Clio halls, marking the administration of president Carnahan; the Halsted observatory, gymnasium, Dickinson, Reunion, Witherspoon, Edwards, and Murray halls; school of science, library, new observatory, and the Marquand chapel now being built. There are also commodious residences for the president and many of the professors.

NEW JERSEY TEA. See Red Root, *ante.*

NEW JERUSALEM CHURCH. See Swedenborgians, *ante.*

NEW JOHORE', formerly Tanjong Putri, a Malay settlement on the southern extremity of the Malay peninsula. Here the rajah or tummongong of Johore, who is an independent sovereign, occasionally resides. The climate is healthy; large quantities of gambir and pepper are raised in the vicinity; saw-mills on an extensive scale are in operation. Vessels of the largest draught can approach close to the shore. The valuable timbers of these immense forests are yet scarcely known, but must find their way to the Indian, if not European markets ere long. Pop. in the New Johore territory about 20,000, chiefly Chinese.

NEW KENT, a co. in e. Virginia, having the Broad York river, formed by the union of the Pamunkey and Mattapony rivers, for its n.e. boundary; and the Chickahominy river for its s. and s.w. boundary; 270 sq.m.; pop. '80, 5,515—5,501 of American birth, 3,240 colored. It is intersected in the extreme n.w. by the Richmond, York river, and Chesapeake railroad. Its surface is generally level, and largely covered with forests. Its soil is a light sandy loam, and produces wheat, corn, tobacco, and sorghum. Horses, cattle, sheep, and swine are raised. Co. seat, New Kent Court House.

NEW LANARK. See Lanark, *ante.*

NEW LEBANON, a t. in s.e. New York, on the Harlem Extension railroad; pop. '70, 2,459. It is 18 m. from Chatham Four Corners, and 24 m. s.e. of Albany. It includes the villages of Mount Lebanon, Lebanon Springs, Tildens, New Lebanon Center, West Lebanon, and New Britain. The Shaker village of Mount Lebanon is inhabited by nearly 600 persons owning about 4,000 acres of land, which they industriously cultivate, and store their produce in 8 barns, one of which, built of stone, is 196 × 50 ft., and said to be the best in the country. They live in 8 dwelling houses, and have 26 workshops, 2 seed establishment, saw and grist mills, and manufactories of chairs, brooms, and baskets. A kind of cider apple-sauce is made and largely exported. They are specially occupied in preserving garden seeds and preparing extracts of roots and herbs, the annual production being about 200,000 lbs. They have a laboratory, and a large meeting-house. Lebanon Springs is a summer resort noted for its thermal springs, the largest of which discharges 16 barrels of water per minute, with a uniform temperature of 73° at all seasons. It supplies what the baths require, and the water-power for 3 mills, which are run the year round. It has a number of first-class hotels. In the town is a factory where thermometers and barometers are made, said to be the first established in the United States. It has also an extensive manufactory of medicines, with a glass-factory under the same management. The manufacture of vinegar is among the industries, and it has 8 churches, public schools, a young ladies' seminary, and 2 newspapers.

NEW LEON, one of the states of the Mexican confederation. It is bounded by Tamaulipas, San Luis Potosi, Zacatecas, and Cohahuila; has an area of 23,632 sq.m.; and a pop. of 145,000 whites and mestizoes. The surface is generally mountainous, the soil fertile, and the climate healthy. Lead, gold, silver, and salt are found within its limits. The natural resources of the state have suffered in their development by many military disturbances. The capital is Monterey, and other chief towns are Florida, Saltillo, and Lanares.

NEW LONDON, a co. in s.e. Connecticut, bordering on Rhode Island, and bounded s. by Long Island sound and the Atlantic, and s.w. by the Connecticut river; drained also by the Thames, Yantic, Shetucket, and Quinnebaug rivers; intersected by several railroads, the chief being the Shore Line branch of the New York and New Haven consolidated road, the Stonington and Providence, and the Boston, Hartford and Erie; about 600 sq.m.: pop. '80, 73,137—58,965 of American birth, 1,591 colored. The surface is very hilly, but not rugged; the soil is only moderately fertile; oats, Indian corn, potatoes, and dairy products are the staples; the sloping hills give excellent pasturage for cattle. Extensive granite quarries are found near New London. Water-power is furnished in abundance by the streams, and there are extensive manufactures of cotton and woolen goods, furniture, flour, articles of india rubber, paper, fish oil, and other productions. In former years the inhabitants were in great numbers interested in the whale fisheries. The chief towns are New London and Norwich, the former being the co. seat.

NEW LONDON, a city and port of entry in Connecticut, on the right bank of the river Thames, 3 m. from Long Island sound, 40 m. s.e. of New Haven. It is a rich and handsome town, with a custom-house, 11 churches, academy, public schools, a daily and a weekly paper, 5 banks, several iron-foundries and steam saw-mills, a machine-manufacturing company, a deep, secure harbor, protected by a fort of 80 guns, with 20,000 tons of shipping, much of it engaged in the whale fisheries, and railway and steamboat communications. Pop. '70, 9,576. It was settled in 1644, and in 1781 burned by gen. Arnold.

NEW LONDON (*ante*), one of the capitals of New London co., Conn.; about 60 m. s.w. of Providence, and 40 m. s.e. of Hartford; the terminus of the Shore Line division of the New York and New Haven, the New London and Northern, and the Stonington and Providence railroads; connected also with New York by a line of large steamboats; pop. '80, 10,529. The city, on the w. bank of the Thames near its mouth, lies at the foot and on the slope of hills which rise behind it. The harbor is a very fine one, 3 m. in length and of a good depth. It is guarded by fort Trumbull, 80 guns, in which a garrison is constantly maintained by the government. The U. S. navy yard is on the e. side of the river above the city. On the same bank is fort Griswold, in Groton, the scene of a massacre by the British forces under Benedict Arnold in 1781. The town was originally settled by colonists under the lead of a son of gov. Winthrop of Massachusetts. The principal public buildings are the city-hall, custom-house, and court-house. There are 10 churches, 6 or 7 banks, schools and academies, and 2 or 3 hotels, one of which, on the sound, at the mouth of the river, is a very popular summer resort. The chief manufactures are woolen, sewing silks, machinery, and hardware. The people formerly for many years were engaged in the whale fisheries, the source of much wealth: that business declined; but recently many vessels have been sent out to the sealing grounds of Alaska and the South Shetland islands. The number of vessels belonging to the port is not far from 200.

NEW MADRID, a co. in s.e. Missouri, having the Mississippi river for its s.e. boundary, separating it from Kentucky and Tennessee; the Little river for its s.; and drained by White river; 750 sq.m.; pop. '80, 7,694—7,587 of American birth, 1881 colored. Its surface, now diversified by swamps, prairie land, and bayous, was considerably lowered in the central portion by the earthquake of 1811–12, forming a large lake. It has another lake in the w. portion, and its soil is very fertile. Corn and pork are raised, and there is good pasturage for live stock. Co. seat, New Madrid Court House.

NEW MADRID, a village in s.e. Missouri, settled 1780; on the upper Mississippi river; pop. '70, 634. It is in the township of New Madrid, the co. seat of New Madrid county, 40 m. s.w. of Cairo, Illinois, 280 m, s.e. of Jefferson city, at the terminus of the Little River Valley and Arkansas railroad. It is in the center of a fertile agricultural district, and has an extensive trade by the river in market produce, lumber, and live stock: large cargoes being sent down the river to supply southern markets. It was settled by Spaniards from Louisiana, and has received severe shocks from earthquakes, notably that of 1811, which have destroyed most of the original town. The present village is built principally of wood. It has 3 churches and a newspaper.

NEW MALTON. See Malton.

NEWMAN, Edward, 1801–76; b. England; founded the *Entomological Magazine* in 1833, and the *Entomologist* in 1840. In the latter year he began business as a printer and publisher in London, retiring in 1869. He edited the *Zoologist* in 1843, and the *Phytologist* in 1844. He published a *History of British Ferns*, 1846; *The Insect Hunters, or Entomology in Verse*, 1858; *A Dictionary of British Birds*, 1866; *Illustrated History of British Moths*, 1869; and *Illustrated History of British Butterflies*, 1871. His researches were specially devoted to the study of insects injurious to vegetation.

NEWMAN, Francis, d. 1660; b. England; settled in New Hampshire in 1638, and afterwards removed to Connecticut. He was secretary of New Haven colony in the administration of gov. Theophilus Eaton, and was an assistant in 1653, in which year he went to Manhattan as a commissioner for the colony to demand reparation from gov. Stuyvesant for damages inflicted upon the New Haven people by the Dutch. He was one of the commissioners of the confederation of colonies in 1654 and 1658, and succeeded Eaton as governor in the latter year, retaining the office till his death.

NEWMAN, Francis William. brother of the preceding, was b. in London in 1805, and educated at the school of Ealing. Thence he passed to Worcester college, Oxford, where he obtained first-class honors in classics and mathematics in 1826, and, in the same year, a fellowship in Baliol college. This fellowship, however, he resigned; and he withdrew from the university in 1830, at the approach of the time for taking the degree of M.A., declining the subscription to the 39 articles which was required from candidates for the degree. After a lengthened tour in the east he was appointed classical tutor in Bristol college, 1834. In 1840 he accepted a similar professorship in Manchester New college, and, in 1846, his great reputation for scholarship and his general accomplishments led to his being appointed to the chair of Latin in University college, London, which he held till 1863. During all this time he has not only been an active contributor to numerous literary and scientific periodicals, and to various branches of ancient and modern literature, but has also had a leading part in the controversies on religion, in which he has taken the line directly opposite to that chosen by his elder brother, being no less ardent as a disciple of the extreme rationalistic school than John Henry Newman of the dogmatical. These opinions, and the system founded upon them, form the subject of his well-known work, *Phases of Faith, or Passages from the History of my Creed* (1850); and of many essays in the *Westminster, Eclectic*, and other reviews; but he is also the author of very many separate publications. Of these several regard the controversy to which we have referred—as, *Catholic Union; Essays Towards a Church of the Future* (1844); *A State Church not Defensible* (1846); a *History of the Hebrew Monarchy* (1847); *The Soul, its Sorrows and Aspirations* (1849). Others are on political or social topics—as, *Radical Reforms, Financial and Organic* (1848); *The Crimes of the House of Hapsburg* (1851); *Lectures on Political Economy* (1857); *Europe of the Near Future* (1871). A large number are devoted to historical, classical, and scientific subjects, the most important of which are *Contrasts of Ancient and Modern History* (1847); *Regal Rome* (1852); translations into "unrhymed meter" of the *Odes of Horace* (1853), and the *Iliad of Homer* (1856); a treatise on *Difficulties of Elementary Geometry; Handbook of Arabic* (1866); *Orthoepy* (1869), etc.

NEWMAN, John Henry, D.D., was b. in London, Feb. 21, 1801, and educated at the school of Dr. Nicholas, at Ealing, whence he passed in 1816 to Trinity college, Oxford, of which college he became a scholar by competitive examination in 1818. Having graduated in 1820, he was elected fellow of Oriel college in 1822, where he attracted the notice of Dr. Whately, and was by him employed in the preparation for publication of his well-known *Treatise on Logic*, and introduced to the editor of the *Encyclopedia Metropolitana*, to which he became a contributor. He was ordained in 1824; and in the following year, his friend Dr. Whately having been appointed head of St. Alban's hall, Newman was by him selected as his vice-principal; but on being named tutor in his own college in 1827, as also public examiner, he resigned the vice-principalship. In 1828 he was presented to the vicarage of St. Mary's, Oxford; in which church the sermons which he delivered at a late period had an extraordinary influence in forwarding the religious movement with which his name is permanently associated. At this period Newman was an earnest antagonist of the Roman Catholic church. He was one of those who transferred their support from sir Robert Peel to sir Robert Inglis on occasion of the former's introducing the Roman Catholic relief bill: and he was one of the most active in commencing and carrying on the so-called Oxford movement—the great object of which was to counteract as well the Romanizing as the dissenting tendencies of the time, by restoring and bringing into notice what Newman and his friends believed to be the Catholic character of the English church. With this view he commenced, in 1833, the series known as the *Oxford Tracts*, to which he was himself one of the chief contributors; and in 1838 he also became editor of the *British Critic*, which was an organ of the same views, and, in conjunction with Drs. Pusey and Keble, of a *Library of Translations from the Greek and Latin Fathers*. He continued the publication of the tracts up to the 90th number, which was written by himself, and the tendency of which was so distasteful to the Anglican authorities that the heads of houses at Oxford condemned the tract, and the Bishop of Oxford called on Newman to discontinue the publication—a request with which he at once complied The *British Critic* continued for some time longer to advocate the same opinions; but in 1843 that publication also was discontinued; and Newman, who had for some time resided at Littlemore, near Oxford, engaged, in company with some of his more youthful adherents, in study and ascetic exercises, thenceforward confined himself chiefly to his Littlemore residence, and eventually, in Oct., 1845, was admitted into the Roman Catholic church, a step which was immediately followed by the publication of a work on the *Development of Doctrine*, which was intended as an explanation of the process through which the writer's own mind had passed. Soon afterwards Newman repaired to Rome, where, after some preparation, he was admitted to orders in the Roman Catholic church; and in 1848, on his return to England, he established a branch of the congregation of the oratory of St. Philip Neri, of which he was himself appointed the superior. In 1852 he was appointed rector of the Catholic university established in Dublin, an office which he held for five years, afterwards returning to Birmingham, where he still resides, and in connection with which he has established a school of higher studies for the youth of the Roman Catholic religion. Dr. Newman, in addition to the large share which he had in the publications already named, is the author of several very important works, written as well before as after his withdrawal from Anglicanism. Of the former period are his *History of the Arians; Prophetical Office of the Church; The Church of the Fathers;* an *Essay on Miracles;* a *Translation of the Treatises of St. Athanasius*, with many learned dissertations, and several volumes of sermons. To the latter period belong the *Development of Christian Doctrine; Lectures on Catholicism in England; Apologia pro Vitâ Suâ; Letter to Dr. Pusey; Essay on Assent;* and *Letter to the Duke of Norfolk on Mr. Gladstone's Expostulation* (1875). Newman is also the author of two religious tales, *Loss and Gain* and *Callista*, and of some fine hymns. He was made a cardinal deacon of the church in 1879.

NEWMAN, John P., d.d., b. New York, 1826; educated at Cazenovia seminary, and entered the ministry of the Methodist Episcopal church. He was for some years pastor of the Metropolitan church of that denomination in Washington, and was chaplain of the U. S. senate, 1869–74. Gen. Grant sent him to Asia as an official inspector of consulates, and he has published a couple of books of travels, describing his oriental tour. He is now (1881) pastor of a church in New York.

NEWMAN, Samuel, 1602–1663; b. England; educated at Oxford, graduated in 1620, and became a minister of the established church. In 1636 he came as a Puritan to Dorchester, Mass., remaining there about a year and a half, when he removed to Weymouth, being settled there five years. In 1644 with several members of his church he went to Seconet, then a small settlement, and established a church, founding a community out of which grew the town of Rehoboth, formerly including Seekonk and Pawtucket. He is called "the first minister of Rehoboth" where he continued his labors till his death. His *Cambridge Concordance*, a valuable work, was first published in 1643, a new addition appearing in Cambridge in 1683, and a fifth much improved edition was published in London, 1720.

NEWMAN, Samuel P., 1796–1842; b. Mass.; son of Mark H., the publisher; graduated at Bowdoin college, class of 1816. In 1824 he accepted the chair of professor of rhetoric and oratory in the same institution, remaining there fifteen years, when he was appointed superintendent of a state normal school which position he held at the time of his death. He published *Elements of Political Economy*, *The Southern Eclectic Readers*, and a *Practical System of Rhetoric*, the latter reaching sixty editions in this country and in Europe, and six editions in London. His works have received the approval of some leading educators.

NEWMARKET, a market-t. of England, famous for its horse-races, is situated in a valley 13 m. e.n.e. of Cambridge, and is partly in the county of that name and partly in Suffolk. It contains many well-built and elegant houses, the residences in many cases of gentlemen who are drawn hither from their interest in the *turf*. The market-house and the famous jockey club are the chief edifices. Malt-making and brewing are carried on to some extent; but the town owes its prosperity to the horse-races, and nearly the half of the population are jockeys, grooms, trainers, or stablemen. The race-course of Newmarket, owned partly by the jockey club, and partly by the duke of Rutland, is said to be the finest in the world, and the training-ground bears a similar character for excellence. There are seven race-meetings held here annually. See HORSE-RACING. The population in 1871 was 4,534.

NEW MEXICO, a territory belonging to the United States, formerly a state of Mexico, in lat. 81° 22′ to 37° n., long. 103° to 109° 9′ w., 350 m. from e. to w., and 850 to 400 from n. to s., with an area of 121,201 sq. miles; bounded n. by the state of Colorado; e. by the Indian territory and Texas; s. by Texas and Mexico; and w. by Arizona. Its chief towns are Santa Fé, Albuquerque, Taos, Silver City, Mesilla. Its chief rivers are the Rio Grande, which crosses the territory from north to south; the Pecos, a branch of the Rio Grande; the Colorado, on the California boundary; the Gila, which rises in the Rocky mountains, and flows westward into the Colorado. These rivers and their branches water broad and fertile valleys, and supply the lack of rain by irrigation. Two great chains of the Rocky mountains or Cordilleras pass through the eastern portion of the territory from north to south, and lesser mountain-ranges diversify the west, rising to elevations of 12,000 feet. The climate is cold in the elevated regions, hot in the plains, but everywhere dry and healthy. Heavy rains fall in July and August, but the rest of the year is dry. The productions are wheat, maize, fruits, and tobacco, with abundant pasturage. There are numerous mines of gold, silver, copper, iron, and salt. Merchandise is transported from St. Louis and Texas in wagon or mule trains. The Indian population consists of 25,268 who sustain tribal relations, and 1309 out of these relations—total, 26,577. The tribes are the wild and predatory Navajoes, Apaches, Utahs, Comanches, etc., who possess large herds of horses, and make perpetual war upon the neighboring settlements. This territory was explored by the Spaniards in 1537, who opened mines, established missions, and made some progress in civilizing the natives. In 1846, Santa Fé, the capital, was taken by an American expedition under gen. Kearney. At the close of the war in 1848 New Mexico was ceded to the United States, and erected into a territory in 1850. White population in 1870, 90,393.

NEW MEXICO (*ante*). Since this territory came into the possession of the United States by the treaty of Gaudalupe Hidalgo, it has always been considered a region of promise both in respect to its physical conditions and its natural resources. In 1850 it was organized as a territory; and three years later the region south of the Gila river known as the Gadsden purchase was obtained through another treaty with Mexico and annexed. The territory then contained, besides the region within its present limits, the whole of Arizona and a portion of Colorado and Nevada. But in 1861 a tract of about 14,000 sq.m. east of the Rocky mountains, between the 37th and 38th parallel was annexed to Colorado; and in 1863 Arizona was set off. New Mexico is now divided into 13 counties and the government is established upon the ordinary model of territorial governments; that is, the executive power is administered by a governor and secretary, appointed by the president with the consent of the senate for four years, and by an auditor, treasurer, adjt.gen., and atty.gen. chosen by the territorial legislature. The capital, Santa Fé, is next to St. Augustine, Fla., the oldest town in the United States. The population of the territory has been steadily increasing during the past ten years. Of the total population in 1870, 86,254 were natives and 5,620 of foreign birth, 47,135 males and 44,789 females. There were 21,449 families with an average of 4.28 persons to each, and 21,053 dwellings with an average of 4.36 to each. Until within the past six or seven years, however, the south and west portions of the territory have been subject to Indian incursions which have kept settlers back. Pop. '80, 118,430.

Like Coloranda and Nevada, the chief inducements New Mexico offers to those already located within its boundary or to emigrants are its dry and healthful climate and the resources of its mines. In the southern part of the territory the temperature is mild, being seldom below the freezing point, and rarely rising to extreme heat, owing to the elevation of the surface. The sky is usually clear and the atmosphere so dry that meat can frequently be preserved a long while without salt. Iron and steel also rarely rust, though exposed continually day and night. Inflamations and typhoid fevers occasionally prevail in the winter season; but pulmonary diseases are rare and malaria does not exist. The mines of the precious metals, copper, lead, iron, and salt have never been so successfully worked as they might have been, had not the Indians molested their regions. These Indians, however, during the past three or four years have gradually been removed, and new mines now are being opened in many directions. The oldest mining districts are the Old and New Placers, Pinos Altos, Arroya Hondo, Cimmaron, Mangano and Moreno, tracts in the Organ mountains, and also in the Sierras Blanca, Carriza, and the Magdalena mountains. The most available of all these that contain gold are those of the New Placer district which are about 38 m. from Santa Fé. Silver is not now largely mined, but there are deposits of it at Pinos Altos and in the Magdalena mountains. Copper also is found in these regions, and one mine in the first named has yielded as high as 9,000 lbs. of metal a week. Lead occurs in the Pinos Altos mines, in the Organ mountains, and elsewhere. Iron and salt are abundant in several districts throughout the territory. The amount of gold from New Mexico deposited at the United States mints and assay offices to June, 1874, was $1,004,755; of silver $239,574. In 1870 the census stated the number of gold mines to be 17. of which 12 were placer and 5 quartz; number of hands employed, 177; capital invested, $2,384,000; value of material used, $33,138; and the value of products, $343,250.

In agricultural products the territory is not particularly abundant; for with the exception of the valley lands in the immediate vicinity of its rivers and streams, the land is obliged to be irrigated artificially. The most important agricultural regions are the valleys of the Rio Grande and Rio Pecos, which are generally from one to four miles wide, though the former expands in places to 10 or 15 miles. In 1870 there were 4,480 farms and 143,000 acres of improved land. Among the products there were 338,930 bushels of wheat; 640,823 bushels of Indian corn; 67,660 of oats; 28,856 of peas and beans; 8,587 lbs. of tobacco; 684,930 lbs. of wool; and 12,912 lbs. of butter. The ordinary cereals all grow sufficiently well in the territory; but wheat, maize, pumpkins, onions, and beans afford the principal supplies of vegetable food. The land and the climate are especially suited for the cultivation of the apple, peach, melon, apricot, pomegranate, fig, and the grape. The European vine grows here in the open air, and the wine that is made from it is considered particularly rich. In 1870 there were manufactured 19,686 gallons. Stock-raising, and particularly wool-growing, however, have been for many years the chief occupations of the natives; and for these pursuits the mildness of the climate and the large tracts, where agriculture is not practicable, afford exceptional opportunities. Neither shelter nor hand-feeding is required for the flocks. The valleys, foot-hills, and table-lands are covered with nutritious grasses throughout the year, which provides abundant grazing. The estimated value of the live-stock in the year already mentioned was $2,889,157; and the stock consisted of 26,500 horses; 6,141 mules and asses; 16,417 milch cows, and a total of 186,301 neat cattle; 619,438 sheep; and 11,267 swine.

The number of manufacturing establishments of all kinds throughout the territory in 1870 was 182, which were chiefly flouring and grist mills and saw mills and quartz mills. They employed about 400 hands, and the estimated amount of capital invested was $1,450,695; amount of raw material used, $880,957; and the value of the annual product, $1,489,868. With the completion of the Atchison, Topeka, and Santa Fé railroad to Santa Fé and the Texas and Pacific railroad, which is expected to traverse the territory from e. to w., it is probable that every industry will greatly increase; and the manufactures will undoubtedly prosper better than they have in the past. Gov. Axtell in his message submitted to the legislature in January, 1878, believed that the general condition of the territory was far more prosperous and promising than it had ever been before. At that period the territory was nearly free of debt and the taxation was about one per cent. The total expenses the past two years had been $12,656.72; the total amount paid into the treasury from November 1875 to November 1877 was $118,038.36. Of this amount $33,395.05 was received for licenses and fines, and $84,643.31 for property taxes. This message also directed the attention of parents to the educational condition of the territory, which is low. A few schools were established as far back as 1822 by the Mexican authorities, but the system was never effective; and after the conquest by the United States no public schools were again established until 1872. Two years later 128 schools were reported in operation with 5,420 pupils enrolled. Only a few of these schools, however, are above the grade of primary schools. The number of church organizations is about 158, possessing property valued at $322,621. The denominations represented are Baptist, Methodist, Presbyterian, Protestant Episcopal, and Roman Catholic.

Of important events in the recent history of the territory, mention should be made of the completion in 1875 of the United States military telegraph from Santa Fé to Mesilla, and in 1876 from Mesilla to Tucson, Arizona. During the same year the Denver and Rio Grande railroad also was completed nearly to the territorial line at Trinidad, and direct telegraphic communication was extended to San Diego, Cal., and to El Paso, Mexico.

NEW MILFORD, a t. in Litchfield co., Conn., on the Housatonic river and railroad, 14 m. n. of Danbury, and about 40 m. s.w. of Hartford; pop. '80, 3,907. There are 5 churches, 2 banks, a weekly newspaper; and paper, boots, buttons, hats, and tobacco are manufactured. The village is well laid out, and the streets are shaded with fine elms and surround a handsome common. The place is to some extent a summer resort.

NEW ORLEANS, capital city and port of entry of Louisiana, on the left bank of the Mississippi river, 100 m. from its mouth, lat. 29° 58′ n., long. 90° west. The city is built on the alluvial banks of the river, on ground lower than the high-water level, protected from inundations by the *levee* or embankments, which extend for hundreds of miles on both banks of the river. The streets descend from the river bank to the swamps, and the drainage is by canals which open into lake Pontchartrain, which is on a level with the gulf of Mexico. The city is long and narrow, extending about 6 m. along the river, on an inner and outer curve, giving it the shape of the letter S. The older portion, extending around the outer curve, gave it the name of "the Cresent City." New Orleans is the great port of transhipment for a large portion of the cotton crop of the southern American states, the sugar crop of Louisiana, and the produce of the vast region drained by the Mississippi and its tributaries. It commands 10,000 m. of steamboat navigation, and is the natural entrepôt of one of the richest regions of the world. In the fiscal year ended June 1874, the value of imports into New Orleans was 14,538.864 dollars; of exports, the value was 93,715,710 dollars. The sugar product in 1873 was 108,241,110 lbs., value 8,122,575 dollars. The custom-house is one of the largest buildings in America. The hotels, theaters, and public buildings are on a magnificent scale. There are a branch mint, 55 hospitals, infirmaries, and asylums, several colleges, Roman Catholic cathedral, 150 churches, 7 daily newspapers, extensive cotton-presses, cotton and sugar warehouses, several banks, and all the facilities for a vast commerce. Besides the great river, New Orleans has railways connecting it with the north, east, and west. It is a beautiful, and, but for the very frequent visits of the yellow fever, a healthy city. The visitation of this dreaded epidemic in the lower Mississippi valley in 1878 was one of the most terrible on record. The soil is full of water, so that no excavations can be made. The largest buildings have no cellars below the surface; and in the cemeteries there are no graves, but the dead are placed in tombs, or "ovens," above ground. New Orleans was settled by the French in 1718; with Louisiana, it was transferred to Spain in 1763; soon after re-transferred to France, and sold, with a vast territory drained by the Mississippi and Missouri, by Napoleon I. to the United States in 1803. In 1815 it was successfully defended against a British army, under gen. Packenham, by gen., afterwards president, Jackson. In 1860, Louisiana having seceded from the union, New Orleans became an important center of commercial and military operations, and was closely blockaded by a federal fleet. An expedition of gun-boats, under commander Farragut, forced the defenses near the mouth of the river, April 24, 1862; the city was compelled to surrender, and occupied by gen. Butler as military governor. In 1803, on its cession to the union, the population was about 8,000, mostly French and Spanish; in 1820 it had increased to 27,000; in 1860, to 168,823, and consisted of Americans, French creoles, Irish, etc.; in 1870 it was 191,418.

NEW ORLEANS (*ante*), in magnitude and population, is the ninth city in the United States, and in the value of its exports and foreign commerce ranks next to New York. It comprises about 40 sq.m., one-half of which is closely inhabited, while the rest is barely redeemed from being a swamp. In general appearance it is a mélange of French and American taste, most of the streets running parallel with the Mississippi river present an unbroken line from the lower to the upper limits of the city, a distance of 12 m.; and those at right angles to these extend from the river to the lake. Those in the newer portions of the city are wide, bordered with trees, and have an attractive appearance; and Canal street, the chief thoroughfare, has many handsome stores and private residences. There are 11 public parks and squares, 8 canals for commercial purposes, 10 or 12 for drainage, and 16 markets. Though the city is not notable as a whole for either the beauty or grandeur of its architecture, it has several public buildings that are conspicuous exceptions—the custom-house, the branch mint, the post-office, the city hall, and the St. Charles hotel. Besides these, mention should be made also of the state-house, the university buildings, the charity hospital, the marine hospital, and the Hôtel Dieu, as well as several churches, of which there are 142 in all. In 1861, when the city had attained its greatest commercial prosperity, it received and handled 2,255,448 bales of cotton and 460,000 hhds. of sugar. Since the war its business and prosperity have been much disturbed by political agitation, and by two or three severe visitations of the yellow fever. Nevertheless, during the years 1878–80 its export trade showed a fair increase, and its imports held a steady bulk, though showing a decline in valuation. The imports in 1877 were $11,340.900; in 1878, $8.725,751; in 1879, $8,259,606. The exports for the same years were $70.270,593; $74.866,388; $81,105.822. In consequence of recent navigation improvements, allowing ships of greater burden to come to its wharves, it is believed that the future commerce of New Orleans is to be greatly increased. In the line of manufactures the city can make little claim. Although in 1870 it contained 911 "manufacturing establishments," many of them were scarcely worthy of designation, being principally small manufactories of cotton-seed oil, syrup, and oil, soap, sugar refineries, distilleries, and breweries. Of the other business corporations at that time, there were 5 dry-dock companies and 42 insurance companies, 23 banking institutions, 5 tow-boat companies, and 24 custom-house warehouses. The administrative officers of the city are a mayor and 7 officers known as administrators, who hold their offices two years, together with a board of health, a city surveyor, city attorney, and school superintendent. The police are sort of a mounted state militia, rather than a metropolitan organization, and are under the control of the governor of the state. According to the census of 1870 the assessed value of the real and personal estate was $146,718,888; its true value, $185,625,187. The total taxation not national was $4,191,417. The public debt of the city was $26,500,000. The public schools, of which there were about 80, are under state control, although the city provides for their support. Other educational institutions are the university of Louisiana, the mechanical and agricultural college, the dental college, and the Jesuit college. Most of the French, Italian, Spanish, and Irish population is Roman Catholic; the American and German residents are chiefly Protestants. There are 36 Roman Catholic churches; 25 Baptist; 11 Protestant Episcopal; 5 Evangelical Protestant; 1 Greek; 3 Lutheran; 19 Methodist Episcopal; 11 Methodist; 12 Presbyterian; 1 Swedenborgian; and 1 Unitarian, and 6 Hebrew synagogues. In conclusion it may be said that, although New Orleans is usually believed to be an unhealthy city to reside in, a careful comparison of its vital statistics with those of other cities, not only in the United States but throughout the world, shows that on the whole it is not exceptionally unhealthy. Since the epidemic of 1878 vigorous sanitary improvements have been in progress. The temperature is rarely in the extreme, the average maximum for the year being 83.7° Fahr., the average minimum 51.8°, and the general average about 67°.

NEW PHILADELPHIA, a village in e. Ohio, on the Tuscarawas river, near the Ohio canal; pop. '70, 3,143. It is in Goshen township, 100 m. by rail s.e. of Cleveland, 24 m. s.w. of Canton, 98 m. n. of Marietta, and 100 m. w. of Pittsburg. It is the e. terminus of the Cleveland and Pittsburg railroad, and is a junction of the Cleveland Tuscarawas Valley and Wheeling, and the Marietta, Pittsburg and Cleveland railroads. It is in the midst of the Tuscarawas bituminous coal and iron region, and the country abounds in coal and iron ore. It has 7 churches, 4 banks, one of them national, good public schools, and 3 newspapers. Its leading industries are the manufacture of woolen goods, agricultural machines, lumber, flour, salt, matches, carriages, paper, boilers, etc.

NEW PHILIPPINES. See CAROLINE ISLANDS.

NEWPORT, a parliamentary and municipal borough, market-town, and river-port of England, chief town of the Isle of Wight, and situated near the center of that island, on the Medina, which is navigable up to this point. St. Thomas's church, founded in 1854, on the site of an ancient structure built in the reign of Henry III., is a handsome edifice, and contains a monument erected by her majesty in memory of the princess Elizabeth, daughter of Charles I., who died at Carisbrooke castle, Sept. 8, 1650. Among the educational establishments of Newport is the free grammar school, in which frequent meetings and negotiations between Charles I. and the parliamentary commissioners took place. About a mile n. of Newport is Carisbrooke castle, where the king was confined under the guardianship of col. Hammond for twelve months (1647–1648). There are several important institutions in the vicinity, as the Albany barracks, the house of industry, and the Parkhurst prison for juvenile convicts. Manufactures of lace are carried on to some extent. Vessels of considerable tonnage can ascend to the quay at high tides. Pop. '71, 7,956.

NEWPORT, a thriving market-town, parliamentary and municipal borough, and river-port of England, in the co. of Monmouth, and 24 m. s.s.w. of the town of that name, on the Usk, and about 4 m. from the mouth of that river. It was anciently the port of the city of Caerleon, about 3 m. further up the river; but during the present century, it has become a shipping port of considerable importance, being the outlet of the produce of the extensive collieries, and iron and tin works of the neighborhood. It possesses a number of recently-erected public buildings, has spacious docks, manufactures nails and spikes extensively, exports iron and coal largely, and carries on an excellent general trade. In 1875, 10,243 vessels, of 1,100,891 tons, entered and cleared the port. Newport unites with Monmouth and Usk in sending a member to parliament. The remains of Newport castle are now used as a brewery. Pop. '71, 27,069.

NEWPORT, a co. in s.e. Rhode Island, having the state line of Massachusetts for its e. boundary, and Acoakset river flowing from Watuppa pond to the sea. It consists of several islands, Rhode island, Canonicut, Goat, and others of less dimensions, besides the portion of the mainland separated from Rhode Island by the e. passage of Narragansett bay; 100 sq.m.; pop. '80, 24,180—19,589 of American birth, 1129 colored. It is intersected by the Old Colony and Newport railroad, terminating at Newport. Prudence island is included in its territory, and Block island lying s.w. in the ocean. Its surface is much diversified by hill, valley, and stream, and is noted for pleasing scenery and beautiful drives. It contains beds of anthracite coal. Its soil is fertile and produces grain, great quantities of apples and other fruit, dairy products, and wool. Clams are dug along the shore, a lucrative business in the summer. Live stock is extensively raised. It contains Fort Adams and the fashionable summer resort of Newport. Its leading industries include the manufacture of flour, fish oil, copper ware, cotton goods, cotton and woolen machinery, carriages, upholstery, and shipping. Co. seat, Newport.

NEWPORT, a city of Kentucky, United States, on the Ohio river, opposite Cincinnati, and on the e. side of the mouth of the Licking river, opposite Covington. It contains a U. S. arsenal, and several iron foundries and rolling mills. Pop. '70, 15,087.

NEWPORT (*ante*), the co. seat of Campbell co., on the Kentucky Central, and Louisville, Cincinnati and Lexington railroads; pop. '80, 20,433. It is built on a high plain; the streets are regularly laid out, and ornamented with shade trees. A bridge over the Licking river connects it with Covington. It is connected by street railroads with Cincinnati, Covington, Dayton, and Belleview. There are many manufactories, foundries, and rolling mills. It has a number of churches, public schools, a U. S. arsenal, banks, a tri-weekly and a weekly newspaper.

NEWPORT, a city and port of entry, and semi-capital of Rhode Island, United States, on the w. shore of the *island* of Rhode Island in Narragansett bay, 5 m. from the ocean. Lat. 41° 29′ n., long. 71° 19′ 12″ west. It has a deep, excellent harbor, defended by forts Adams and Wolcott. It has a state-house, custom-house, market, the Redwood library, many large hotels, and elegant villas; it is renowned for fine scenery and sea-bathing; and is one of the most fashionable watering-places in America. The town also contains cotton and other manufactures. It was settled, in 1638, by 17 adherents of Roger Williams, who followed him in his banishment from Massachusetts. In 1874 Newport had 135 sailing and steam vessels, of 8,660 tons. It was for a time the residence of bishop Berkeley. Pop. '70, 12,552.

NEWPORT (*ante*) is defended by fort Adams, 3½ m. distant, the third strongest fortress in the United States. The state house fronting Washington square, through which Washington passed to meet Rochambeau, was built in 1742. The Jewish synagogue on Touro street, built in 1762, was the first in this country. Judah Touro, a son of one of its pastors, gave to the city Touro park, on which stands the "Round Tower" or "Old Stone Mill," a circular stone tower with round arches. A Norse origin has been ascribed to it, but Palfrey, in his *History of New England*, has pretty conclusively shown that it was an old colonial wind-mill. Near the old mill is a statue of commodore M. C. Perry. Trinity church, on Church st., has an organ presented by Berkeley. On Clarke st. are the central Baptist church, founded in 1733, the armory of the Newport artillery company, formed in 1733, and the Vernon house, Rochambeau's headquarters in 1780. Franklin's printing-press, imported in 1720, is still in the office of the *Weekly Mercury*, founded in 1758. The fashionable drive of Newport is Bellevue ave., a broad street 2 m. long. There is excellent surf bathing off the First beach; the Second, or Sachuest beach, is a favorite riding-course. Old Newport, with many colonial mansions and narrow streets, is almost surrounded by the new town. Aside from the bathing, boating, and driving facilities of Newport, its chief attraction is its equable climate. The city is connected with Boston by the Old Colony and Newport railroad, and with New York by the Shore line, 67 m. from Boston, 180 m. from New York; pop. 15,693. The daily steamers of the Fall River line to New York touch here. Steamers run daily to Providence and Rocky Point. Newport harbor was visited by Verrazzani in the 16th c., and by several subsequent English explorers. It was settled in 1639 by a party of colonists, adherents of Roger Williams, under William Coddington. Its relative importance a century ago was much greater than now. Its population in 1774 was 12,000, and its commerce next to Boston, and much larger than that of New York. It was captured in 1776 by the British, who held it till 1779. The next year a French fleet having on board the count de Rochambeau and 6,000 French soldiers, arrived at Newport. President Adams founded a naval station there, and the torpedo division of the U. S. naval service, with a school for the instruction of young officers in the torpedo service, is situated on Goat island. Among the historical names of Newport are dean Berkeley, who came to Newport in 1729 to found a university for the conversion of the Indians, built a house called "Whitehall," about 3 m. from the city, and returned to England in 1731, dividing his Newport estate between Harvard and Yale colleges; Drs. Samuel Hopkins and Ezra Stiles, the latter afterwards president of Yale; and William Ellery Channing, who was born 1780, in the Channing mansion, built 1720, on Thames street.

NEWPORT, Christopher, b. England, about 1565; commander of the vessels which brought over the Jamestown colony in 1606, and a member of the council for the government of that colony. Returning to England after a visit with capt. John Smith to Powhatan, he brought over 120 additional emigrants in 1608. Near Richmond he found some yellow mica, with which he loaded his vessels, supposing it to be gold. He came over with lord Delaware in 1610, was wrecked at the Bermudas, and returned to England in 1612. He wrote *Discoveries in America*.

NEWPORT-PAGNELL, a small market town in England, in Buckinghamshire, on the Ousel, 50 m. n.n.w. of London. Lace is manufactured extensively, and there is a good trade in corn, coal, and timber. Pop. '71, 3,655.

NEW PROVIDENCE, one of the Bahama islands, between Eleuthera and Andros, in lat. 25° 5' n.; long. 21° 77' w., 17 m. long by about 7 wide; pop. 9,000. The surface is broken with hills, but some parts are fertile. Nassau, the capital of the island, is on the n. coast. New Providence was originally an English colony, founded in 1629, was twice captured by Spain, and definitely given back to England by the peace of 1783.

NEW RED SANDSTONE. A large series of reddish colored loams, shales, and sandstones, occurring between the carboniferous rocks and the lias, were grouped together under this name, in contradistinction to the old red sandstone group, which lies below the coal-measures, and has a similar mineral structure. Conybeare and Buckland proposed the title Poikilitic (Gr. variegated) for the same strata, because some of the most characteristic beds are variegated with spots and streaks of light-blue, green, and buff on a red base. In the progress of geology, however, it was found that two very distinct periods were included under these names; and the contained fossils of each group were found to be so remarkably different that the one period was referred to the paleozoic series, under the name of permian (q.v.), while the other, known as the trias (q.v.), was determined to belong to the secondary series.

NEW RICHMOND, a village in s. Ohio, on the e. bank of the Ohio river; 20 m. s.e. of Cincinnati; pop. '70, 2,516. It is in Ohio township, Clermont co., which is the chief town in respect to population and active trade in the county. It has 8 churches, good public schools, a newspaper, a national bank, a loan and fund association, and a town-hall. Its leading industries are the manufacture of chairs and woolen goods; and it has steam, saw, and grist mills, distilleries, tobacco factories, foundries, and breweries.

NEW ROCHELLE, a t. in s.e. New York, on Long Island sound, at the junction of the Harlem River branch railroad with the New York, New Haven, and Hartford; 18 m. from New York; pop. '70, 4,698. It contains many beautiful residences and is a favorite resort from the cities of the vicinity. It has 7 churches, good schools, a savings bank, 5 hotels, 2 weekly newspapers, a variety of stores, and an establishment for the manufacture of scales.

NEW ROSS, a seaport and parliamentary borough of Ireland, situated on the estuary of the Barrow, partly in the county of Kilkenny, but chiefly in that of Wexford, distant 84 m. s.s.w. from Dublin. It is an ancient town, having been surrounded by walls about the middle of the 13th century. Before the union, it returned two members to parliament, of whom one was withdrawn by the act of union. It is now a place of considerable commerce, and the modern part of the town on the Wexford side is built with great regularity and taste. On the Kilkenny side is a straggling suburb called Rosbercon, connected with New Ross by a metal bridge, erected at a cost of £50,137, which has a swivel-pillar in the center, to allow vessels to pass; formerly the connection was by a wooden bridge, nearly 700 feet in length. The port is approachable at spring-tides by ships of 800 tons, and at all times by vessels of 600 tons; and there is a communication by river and canal with Dublin, and also with Limerick. The town is managed by a board of 21 commissioners. It possesses no manufactures of any importance. Pop. '71, 6,772.

NEW RUSSIA. See RUSSIA.

NEW RUTLAND, a t. in n. Illinois, in the extreme s.e. of La Salle co.; pop. '70, about 800. It is on the Illinois Central railroad, in the township of Groveland, and its railway station is called Rutland. It has 5 churches, excellent schools, several hotels, and a grain elevator. Its leading industries are the manufacture of harness, furniture, flour, and wagons; and coal is mined in the vicinity.

NEWRY, a seaport and parliamentary borough, situated partly in the county of Armagh, but principally in the county of Down, Ireland, distant from Dublin 68 m. n., and from Belfast 38 m. s.s.w, with both which places it is connected by a branch-railway communicating with the Dublin and Belfast Junction railway. The town is nearly coeval with the English invasion, having grown up around a monastery founded in 1183, and a castle subsequently erected by De Courcey. This castle was the scene of several struggles; and in most of the civil wars of Ulster, Newry suffered severely. It was incorporated as a borough, with a corporation and two members of parliament, by James I. Since the union, it returns but one member, and the corporation having been abolished by the Irish municipal reform act, the affairs of the town are now administered by 21 commissioners. It is traversed by a river of the same name, which falls into Carlingford lough, and by a canal, by which the navigation is prolonged to lough Neagh, a distance of 32 miles. A commission has been appointed for improving Carlingford lough and to remove the bar; the estimated cost being £80,000. The town is handsomely and compactly built. The quays are lined with spacious warehouses, and there are several mills, tanyards, coach and car manufactories, and iron foundries. Extensive waterworks have recently been constructed. Linen, cotton, and iron manufactures are carried on. The income of the port is £6,000 yearly. Steam-vessels ply to Liverpool and Glasgow from Warrenpoint, a port 5 m. distant on Carlingford lough; and the Newry and Greenore railway, connecting the Newry and Armagh line with Carlingford lough, is in progress. Pop. '71, 14,158.

NEW SCHOOL AND OLD SCHOOL PRESBYTERIANS, formerly the names of two great parties, and, 1838–70, of the two principal divisions in the Presbyterian church of the United States. The parties were produced, and the rending of the church was caused chiefly by three forces having unequal degrees of strength, but all tending to one result. These may be here named without being fully discussed:

1. *Differences in theological views.* The Presbyterian church in the United States was, at the beginning, composed in a great degree of emigrants from Scotland and Ireland, and in its growth continued to receive fresh accessions from those lands. These brought with them and long retained theological opinions and practices which, while they may be spoken of in general terms as Calvinistic, had manifest traits peculiar to themselves. Yet they did not escape entirely the modifications to which opinions of every kind have been subjected by the isolation, conflicts, and liberty of discussion and action, that have given character to American government, churches, and institutions of every kind. During this time, theology and practical religion were among the chief factors in developing the New England colonies and states. Doctrines furnished themes for thought and discussion among ministers and people in a degree scarcely equaled, unless among the early Greek Christians and the reformers of the 16th century. No wonder, therefore, that important modifications were produced and embraced. And as many ministers and other members of churches went from New England to the other colonies, and afterward to the new states, these modifications entered into Presbyterian churches, accelerating and increasing the changes there. Many too, from these churches, obtained

their education in New England schools and colleges, a part of them becoming Christians there. Andover theological seminary, preceding that at Princeton by 5 years, instructed a portion of Presbyterian students as well as many from New England who became Presbyterian ministers. This brief statement may show how it was that in the American Presbyterian church, there arose the terms, first of "new side," and "old side," with the division they occasioned, and afterward of "new school" and "old school."

2. *Differences of opinion concerning church polity and extension.* The early churches of New England were independent and congregational in government, yet were connected together by mutual conference, and, some of them, by associations gradually formed, and having different degrees of strength. But when Congregational ministers and members removed to other colonies, they generally, until comparatively recent years, became pastors and members of Presbyterian churches already established, or united with Presbyterians in forming new ones. The churches of Newark and vicinity, founded by a Connecticut colony, were at first Congregational, but soon became Presbyterian. In 1801 a plan of union was unanimously proposed by the Presbyterian general assembly to the general association of Connecticut, by whom it was unanimously adopted, with a view on both sides "to prevent alienation, and promote union and harmony in those new settlements which are composed of inhabitants from these bodies." This plan was not only adopted unanimously by the general assembly, but was also for a long time cordially approved by the most eminent ministers in the Presbyterian church. Under the operation of it, and of union with Congregationalists generally, hundreds of the best Presbyterian churches in the land were formed and built up. Yet the polity resulting from the union, like the doctrine embraced, was a Presbyterianism somewhat modified in its usages and forms. This modification entered gradually into the forces which produced the new school and the old school parties. Its chief power, however, was in an element more general than any difference between Presbyterians and Congregationalists alone could have supplied. This was the use of "voluntary societies" in benevolent and missionary work. The country passed through a period, during which many such agencies were formed, chiefly from the necessity for united effort, and partly from want of experience in the work. But as experience and denominational strength increased, conflict between voluntary and more strictly church agencies arose. This conflict entered largely into the development of party spirit between new school and old school Presbyterians.

8. *Differences of opinion and practice concerning slavery and concerning the manner in which it should be treated by Christian churches.* The origin and growth of this difference need not here be traced. It is sufficient to say that it was by far the most powerful of the influences which intensified the party spirit; and that as the region where slavery most prevailed was, because of it, the less subjected to the modifying influences already described, it came to pass that the modified doctrine and polity were found mainly united with opposition to slavery, forming generally new school Presbyterians; and the unmodified doctrine and polity were, in a like degree, united with adherence to slavery, or with silence concerning it, forming generally old school Presbyterians. Without the influence, direct and indirect, of slavery, neither of the other causes, nor both of them combined, would have been strong enough to divide the Presbyterian church; probably not to have caused even a serious attempt to divide it. Reasons for this opinion are found in the fact that after the division the new school part of the church safely outgrew the use of voluntary societies; that just before the reunion the old school portion accepted, as substantially orthodox, the declaration of doctrine made by the new school portion just after the division; that slavery, without auxiliary causes, divided the strong organization of the Methodist Episcopal church; that in the spring of 1861, it divided the old school portion of the church when in "a state of almost unprecedented doctrinal homogeneity;" that it was prevented from rending the national Union itself, only by one of the mightiest conflicts the world has ever known; and that when its power was removed, the process of reuniting new school and old school Presbyterians at once began. At the reunion, agreed to in 1869, and organically effected in 1870, some of the chief statistics were:

	Synods.	Presbyteries.	Ministers.	Churches.	Church Members.	Sunday S. Members.
New School..	22	110	1833	1747	174,626	196,440
Old Schoo...	26	149	2,447	2,859	271,918	254,417

Total amount contributed by both divisions during the year 1869–70, for the support and extension of religion was $8,440,121.

NEW SHOREHAM. See SHOREHAM.

NEW SIBERIA, a group of islands in the Arctic ocean, lying n.n.e. of the mouth of the river Lena, in Eastern Siberia. Lat. 73° 20′ to 76° 12′ n., long. 135° 20′ to 150° 20′ e.; area, 20,480 sq. miles. The principal are Kotelnoi (the largest), Liakov, Fadievskoi, and New Siberia. The coasts are in general rocky, and are covered all the year round with snow.

The islands are very important, on account of the immense multitude of bones and teeth of mammoths, rhinoceroses, buffaloes, etc., which are found in the soil. They are now uninhabited, but there are traces of former inhabitants. Neither bush nor tree is to be seen anywhere.

NEW SOUTH WALES, a British colony in the s.e. of Australia. It originally comprised all the Australian settlements e. of the 135th meridian, but the formation, successively, of the separate colonies of South Australia (1836), Victoria (1851), and Queensland (1859) has reduced it to more moderate dimensions. It is now bounded on the n. by a line which, beginning at Point Danger, in lat. 28° 8′ s., follows several lines of heights across the Dividing Range till it meets the 29th parallel, which forms the rest of the boundary westward; on the w. by the 141st meridian; on the e. by the Pacific ocean; and the line separating it from Victoria on the s. runs from cape Howe, at the s.e. of the island, n.w. to the source of the Murray river, and then along that stream, in a direction w. by n., to the western boundary of the two colonies. Area, 323,437 sq.m., or somewhat less than four times that of the island of Great Britain; pop. '71, 503,981, of whom 275,551 were males, and 228,430 females; '76, 629,776. The more general physical character of the country is described under AUSTRALIA. Within the colony of New South Wales the mountain range, which girdles nearly the whole island, is most continuous and elevated, and is known as the Dividing Range. The section of this mountain system on the southern boundary of the colony, called the Australian Alps, rises in mount Kosciusko to 7,308 feet. From this the range extends northward, the water-shed being from 50 to 150 m. distant from the e. coast, and thus divides the colony into two slopes, with two distinct water-systems. The rivers on the eastern side descend with great rapidity, and in oblique tortuous courses, their channels often forming deep ravines. Many of them are navigable in their lower course for sea-going steamers. The principal are the Richmond, Clarence, McLeay, Manning, Hunter, Hawkesbury, and Shoalhaven. The Hunter river, about 60 m. n. of Sydney, opens up one of the most fertile and delightful districts in the country. The Dividing Range, which, opposite to Sydney, is called the Blue mountains, being singularly abrupt and rugged, and full of frightful chasms, long presented an impenetrable barrier to the west, and kept the colonists shut in between it and the sea, and utterly ignorant of what lay beyond. At last, in 1813, when the cattle were likely to perish in one of those long droughts that appear to visit this country at intervals of a dozen years, three adventurous individuals scaled the formidable barrier, and discovered those downs on the western slope which now form the great sheep-ranges of Australia. A practicable line of road was immediately constructed by convict labor, and the tide of occupation entered on the new and limitless expanse. The numerous streams that rise on the w. side of the water-shed within the colony, all converge and empty their waters into the sea through one channel within the colony of South Australia. The southern and main branch of this great river-system is the Murray. The other great trunks of the system are the Murrumbidgee, which is navigable; the Lachlan, at times reduced to a string of ponds; and the Darling. The Macquarie, passing through the rich district of Bathurst (q.v.), is a large tributary of the Darling, but it reaches it only in the rainy seasons. The coast-line from cape Howe to Point Danger is upward of 700 m. long, and presents numerous good harbors formed by the estuaries of the rivers. Owing to the great extent of the colony, stretching as it does over eleven degrees of latitude, the climate is very various. In the northern districts, which are the warmest, the climate is tropical, the summer heat occasionally rising in inland districts to 120°, while on the high table-lands, weeks of severe frost are sometimes experienced. At Sydney, the mean temperature of the year is about 65°. The mean heat of summer, which lasts here from the beginning of December to the end of February, is about 80°, but it is much modified on the coast by the refreshing breeze. The annual fall of rain is about 50 inches. Rain sometimes descends in continuous torrents, and causes the rivers to rise to an extraordinary height. Sometimes the rains almost fail for two or three years in succession (see AUSTRALIA). The coast, for 300 m. from the northern boundary, is adapted for growing cotton, and in 1868, when a large quantity was grown, the average produce was 180 lbs. per acre; but cotton-planting seems now to have been abandoned. Further s., the climate is more temperate, and is fitted to produce all the grain products of Europe. Immense tracts of land, admirably adapted for agriculture, occur in the south-western interior; while in the s.e. coast districts, the soil is celebrated for its richness and fertility. In the n., the cotton and tobacco plants, the vine, and sugar-cane are grown, and pine-apples, bananas, guavas, lemons, citrons and other tropical fruits are produced. In the cooler regions of the s., peaches, apricots, nectarines, oranges, grapes, pears, pomegranates, melons, and all the British fruits, are grown in perfection, and sometimes in such abundance that the pigs are fed with them. Wheat, barley, oats, maize, and all the cereals and vegetables of Europe are also grown.

Agriculture is thus increasing in importance, though the predominating interest is still pastoral. In 1875–76, there were 36,984 freeholders and leaseholders occupying 13,525,497 acres of land, of which 451,139 acres were under cultivation, 7,771,068 acres inclosed but not cultivated, and the remainder (5,303,290 acres) not inclosed. The largest crops were—wheat (133,610 acres) and maize (117,582 acres). The other crops included oats, barley, rye, potatoes, millet, etc. Considerable attention has been bestowed on the cultivation of the vine and the manufacture of wine. The produce in 1775–76 was 831,749 galls. of wine and 2,748 galls. brandy, besides 768 tons of grapes.

The great produce of the colony is wool, the exports in 1875 amounting to 87,534,280 pounds, valued at £5,651,643. Sheep-farming requires a large capital, together with skill and experience; and the sheep-farmers or squatters form the territorial aristocracy of the colony. All the best pasture land has long been taken up and rented (for periods of 10 to 15 years) from the crown under certain conditions. Stations, or the right of grazing, with the stock on them, are continually advertised for sale; the price of a station is according to the number of cattle or sheep on it. The question of the rent that the "squatters" should pay (which used to be about £10), and of the tenure by which the pasture-lands should be held, was long a source of agitation and bitterness in the colony. They now pay about a farthing a year for each sheep the run can support. According to the present regulations, arable lands are disposed of by two distinct systems of sale—one, to the highest bidder at auction in unlimited quantities; the other, at a fixed price in limited quantities. By this last, known in the colony as "free selection before survey," the intending cultivator can first select for himself, and then secure in fee-simple a quantity not less than 40, and not more than 320 acres, at the rate of 20s. per acre, on condition of residing on his farm, improving a portion of it, and not subletting it.

The coal fields of New South Wales are extensive, and the seams of great thickness. In 1875, 1,253,475 tons, valued at £765,158, were raised. Iron, lead, copper, and oil-shale are abundant. Gold was discovered here in May, 1851, and in that year gold was exported to the amount of £468.336. This amount was increased to £2,660,946 in 1852, but subsequently, owing to the discovery of the richer diggings of Victoria, gold-mining in this colony began to languish. Since 1857, however, the annual amounts found and exported have been steadily increasing; that for 1869 being 234,382 oz., valued at £886,-749; and in 1875 the value exported was £2,094.505, nearly all coin. In 1875 there were in the colony 22,872,882 sheep, 2,856.699 cattle, and 346,691 horses. In 1871 the revenue was £4,709,010; the expenditure £4,179,840; in 1875 the revenue amounted to £4,126,303, and the expenditure to £3,845,632. The exports in 1875 amounted to £13,-671,580, comprising barley, oats, potatoes, live stock, preserved meat, leather, wool, tallow, coal, gold-dust, and sovereigns; the imports, consisting largely of articles for food and clothing, etc., were £13,490,200. The Sydney branch of the royal mint was instituted in 1855, and issues large quantities of gold in sovereigns and half-sovereigns. There were in 1876 about 509 m. of railway already open in the colony, while about 200 m. additional were in course of construction. There is telegraphic communication between all the important places in the colony, and also with other colonies; length of wire in 1876, 8,012 miles. New South Wales is self-governed, with a governor appointed by the queen, a responsible ministry, a legislative council nominated by the crown, and a house of assembly elected by permanent residents. As regards religion, all sects are on a footing of equality. On Jan. 1, 1876, there were 1089 regular places of worship, affording accommodation to 57,000 Episcopalians, 59,000 Roman Catholics, 24,000 Presbyterians, 44,000 Methodists, etc. The number of schools under the council of education in 1875 was 1042; besides these there are 544 private schools. There were, in all, 123,000 scholars. For the higher education, see SYDNEY. The capital is Sydney, with a pop. of 154,494; and the other chief towns are Paramatta, Bathurst (q.v.), Goulburn, Maitland, Newcastle, Grafton, and Armidale, with populations ranging from 3,000 to 17,000.

New South Wales took its origin in a penal establishment, formed by the British government in 1788 at Port Jackson, near Botany bay (lat. 34°). The prisoners, after their period of servitude, or on being pardoned, became settlers, and obtained grants of land; and these "emancipists" and their descendants, together with free emigrants, constitute the present inhabitants. Transportation to New South Wales ceased in 1840, and up to that date the total number of convicts sent thither amounted to 60,700, of whom only 8,700 were women. They were assigned as bond-servants to the free settlers, who were obliged to furnish them with a fixed allowance of clothing and food. In 1833 there were 23,000 free males and 13,500 free females, to 22,000 male and 2,700 female convicts; and of the free population, above 16,000 were emancipists. The following table shows the recent rate of increase in the population:

	Males.	Females.	Total.
1850	154,575	110,928	265,503
1861	202,099	156,179	358,278
1871	275,551	228,430	503,981

The increase of population in Sydney within the past ten or twenty years has been over 33.5 per cent; and in the suburban districts it has been about 60 per cent.

NEWSPAPER, a periodical publication printed and distributed for the circulation of news. From the broad-sheet relating the most meager intelligence without comment or inference, the newspaper has gradually grown up into a powerful political as well as social engine, diffusing information on all subjects of interest, circulating advertisements, and acting on the public mind, in times of excitement, to an extent that has led it to be called a fourth estate of the realm.

The earliest approach to the newspaper is to be found in the *Acta Diurna*, or *Acta Publica*, of ancient Rome, an official gazette, which in the later times of the republic, and during the empire, appeared daily under sanction of the government. The contents of these *Acta* consisted of an enumeration of the births and deaths in Rome, an account of the money paid into the treasury, and everything relating to the supply of corn; extracts from the *Acta Forensica*, including the edicts of magistrates, the testaments of distinguished men, reports of trials, with the names of the acquitted and condemned, a list of the magistrates who were elected; extracts from the *Acta Senatus*, an account of public affairs and foreign wars, of the births, deaths, festivals, and movements of the imperial family; and generally news relating to public buildings, funerals, games, fires, sacrifices, and miracles, as well as amatory stories. The *Acta* seem to have been drawn up under the superintendence of censors, quæstors, and other magistrates, by officers called *actaurii*, assisted by clerks and notaries; and their publication consisted in posting them in some public place in the city, where they could be read by any one who pleased. They continued to be issued until the downfall of the western empire, but there seems never to have been anything corresponding to them at Constantinople.

The beginnings of the newspaper of modern Europe are traceable to Germany and to Venice. Soon after the invention of printing, in the latter half of the 15th c., small news-sheets, called *Relationen* and the *Newe Zeytung*, appeared in Augsburg, Vienna, Ratisbon, and Nürnberg, generally in the form of a letter. The extant numbers contain, among other matters, accounts of the discovery of America, of the conquests of the Turks, of the French and Austrian war in Italy, with such local occurrences as executions, inundations, earthquakes, burnings of witches, and child-murders committed by the Jews. More important, perhaps, were the official *Notizie Scritte*, first issued by the Venetian government in the 16th c., containing accounts of the wars carried on by the republic, and other events of general interest. At first they were not printed, but were to be seen in various public places on payment of a small coin, called a *gazeta*, whence the name "Gazette." After they were allowed by the government to be printed, they obtained a wide circulation over the whole of Europe.

The earliest English newspaper, or news-letters, belong to the reign of James I., and were printed in the form of small quarto pamphlets. Some copies of a sheet, called the *English Mercury*, purporting to be published by authority of queen Elizabeth in 1588, the period of the Spanish Armada, have been proved by Mr. Watts of the British museum to be literary forgeries, executed about 1766. The first English newspapers appeared at occasional and irregular intervals—the earliest of them, so far as ascertained, is entitled *News out of Holland*, and was published for M. Newbery in 1619. In 1622 these occasional pamphlets were converted into the first *printed* newspaper, entitled *The Certaine News of the Present Week*, edited by Nathaniel Butter. About the same time appeared the *London Weekly Courant*. A large number of publications, hardly deserving the name of newspapers, were circulated during the civil war, with such names as *England's Memorable Accidents, The Kingdom's Intelligencer, Mercurius Aulicus, The Scots Intelligencer, The Parliament's Scout, The Parliament's Scout's Discovery, or Certain Information, The Scots Dove, The Parliament Kite, The Secret Owl, Mercurius Mastix, Mercurius Democritus, Mercurius Acheronticus, or News from Hell*, etc. The arrangement of the news is poor in the extreme, and what few comments there are, are of the most virulent description. The long parliament subjected the newspaper press to a censorship, which became more strict under Charles II. The first English newspaper which could properly be considered a vehicle of general information, was the *Public Intelligencer*, established by sir Roger L'Estrange in 1663; it was dropped on the appearance of *The London Gazette*, the first number of which was published Nov. 7, 1665, at Oxford, where the court was residing in consequence of the plague being then in London. A second paper, called *The Observator*, was afterwards started by L'Estrange, who, in 1680, exercised his authority as licenser of the press by issuing a proclamation "for suppressing the printing and publishing of unlicensed news-books and pamphlets of news." Small as was the sheet, a difficulty often arose how to fill it. One publisher was in the way of supplying the dearth of news by a passage from the Bible; another announced that "blank space is left that any gentleman may write his own private business."

Up to the reign of queen Anne few of the newspapers appeared oftener than once a week. From the interest excited by Marlborough's victories arose a demand for more frequent intelligence, and besides 17 newspapers published three times a week, the *Daily Courant*, established in 1709, was issued every day except Sunday. Of the more noted London newspapers, the *London Daily Post and General Advertiser* was established in 1726, and in 1752 became the *Public Advertiser*; a celebrity attaches to it from having been the medium in which "Junius's Letters" first appeared. The *St. James's Chronicle* arose from an amalgamation of two papers, the *St. James's Post* and *St. James's Evening Post*, both which began in 1715. The *North Briton*, edited by Wilkes, first appeared in 1762. The *Morning Chronicle*, discontinued in 1862, dates from 1770; the *Morning Post*, from 1772; the now defunct *Morning Herald*, from 1781; the *Times* first appeared in 1788, as a continuation of the *London Daily Universal Register*, established three years earlier.

During the reign of George III. prosecutions were rife against newspaper writers and editors; their result, generally, was to give a greatly increased currency to the doctrines assailed, and to confer a fictitious importance on the traders in politics, by whom many of the journals were conducted. The first attempt at parliamentary reporting was resented by the house of commons as a breach of privilege, but the resolutions and the imprisonments of 1771 all ended in the tacit concession of publicity of discussion which has ever since prevailed.

The newspapers of Great Britain have, within the present century, greatly increased in size and improved in literary character. In both respects they are far in advance of the journals of any other country. Each number of the *Times* now consists in general of 16 pages, occasionally 24, and contains upwards of 5,000 advertisements. The success of the *Times* is mainly due to the enterprise of its original promoter, Mr. Walter, who first introduced various improvements in the art of printing, and made a strong effort to secure the best literary talent attainable in all departments of his journal. One of the most notable incidents in the history of the *Times*, was the exposure, through means of its Paris correspondent, of a gigantic scheme of forgery, planned in France in 1840—a scheme which contemplated the almost simultaneous presentation, at the chief banking-houses of the continent, of forged letters of credit from Glyn & Co. The failure of the conspiracy was mainly due to the exertions made by the *Times*. One of the parties implicated, brought an action for libel against the printer, and obtained a verdict of one farthing damages. A public subscription was raised to defray the expenses incurred in defending the action; when the proprietors of the *Times*, declining personally to accept the sum subscribed, invested it in two *Times* scholarships in connection with Christ's hospital and the city of London school, for the benefit of pupils proceeding thence to Oxford or Cambridge.

The editing of one of the leading London newspapers involves an immense daily expense, and the co-operation of a number of talented writers. The principal editor, as representative of the proprietors, has the whole oversight and responsibility intrusted to him. He occasionally furnishes the leading article, but it is more frequently composed by one of a staff of literary contributors, who are bound on the shortest notice to write on any subject which the editor may assign. The leader is in form a relic of the time when the newspaper was the news-letter; it is its professed object to analyze, condense, and explain public transactions, to scrutinize what is doubtful or suspicious in the conduct of public men, and to expose sophistry and imposture. Under the editor are various sub-editors, having the superintendence respectively of the London, the provincial, the foreign, the literary, the industrial, and other departments. The commercial article is furnished every evening by a contributor in the city. There are 12 to 16 parliamentary short-hand reporters, who are continually relieving one another, besides reporters attached to the courts of law, and correspondents who furnish accounts of public meetings and local news of various kinds. The foreign intelligence, a most important department in the great London journals, is furnished by correspondents in all parts of the world, some of them, particularly those employed in time of war, being men of very high reputation in the literary world.

A stamp-duty on newspapers was imposed in 1713 by 10 Anne, c. 19, amounting to one halfpenny on "half a sheet or less," and one penny "if larger than a half a sheet, and not exceeding a whole sheet." The duty was raised ½d. by 30 Geo. II. c. 19; another halfpenny was added by 16 Geo. III. c. 34; still another by 29 Geo. III. c. 50; and a further addition of 1½d. was made by 37 Geo. III. c. 90, amounting to 4d. in all. Acts 6 and 7 Will. IV. c. 76, reduced the stamp-duty to 1d., with the addition of ½d. or 1d. when the sheet contained upwards of 1550, or of 2,295 square inches on each side. An additional ½d. was chargeable on a supplement. By 18 and 19 Vict. c. 27, passed in 1855, the newspaper stamp was abolished, a change which occasioned an immense increase in the number of newspapers and diminution of their price, though many of the cheap papers then started were of very brief duration. The repeal of the paper-duty, which took effect on Oct. 1, 1861, also added, though to a much less considerable extent, to the number and cheapness of newspapers. The number of stamps issued on British newspapers was 7,500,000 in 1753, 16,000,000 in 1800, and 65,741,271 in 1850.

In 1843 the number of newspapers published in London was 79; in 1877 it was about 320. Nineteen of these are daily papers, 6 of them published in the evening, and 2 out of the 6 mere reprints of the morning papers, with what news had been received during the day. Of these, the most influential for 40 years back has been the *Times*, established in 1788, of which nearly 70,000 copies are printed daily, and its circulation has been larger on occasions of public interest. It professes independence in politics. The *Daily News*, *Pall Mall Gazette* (an evening paper), *Daily Telegraph*, and *Morning Post* are the most important liberal daily papers, the last named being also the organ of the fashionable world, while the *Standard* and *Globe* (an evening paper), represent the conservative party.

The price of the daily papers varies fom ½d. to 3d. Of the 300 newspapers not daily, most are published once, some twice, some three times, one four times a week, some once a fortnight, and some monthly. They comprise agricultural, sporting, commercial, and railway journals; a dozen or so purely literary, or literary and scientific; military and naval, musical and theatrical, legal and medical journals. There is a *Court Circular* and a *Court Journal*, a French, a German, an Anglo-American, and a Spanish weekly paper. There are a few pictorial and about half-a-dozen humorous papers. Of these last, *Punch*, which has been in existence since 1841, is ably conducted, and wields no small influence. A large number are the organs of particular religious sects or parties. The bankers, drapers, grocers, printers, booksellers, brewers, etc., have their respective journals; the builders have six; and there are many newspapers with a purely local circulation, some confined to the obscurer quarters of London. The price of the weekly papers varies from 6d. to 1d. or ½d.

The earliest English provincial newspaper is believed to be the *Norwich Postman*, published in 1706, at the price of a penny, but "a halfpenny not refused." It was followed, in 1714, by the *Norwich Courant, or Weekly Packet.* A *York Courant*, *Leeds Courant*. and *York Journal* were established about 1720; the *Manchester Gazette* in 1730, and the *Oxford Journal* in 1740. In 1843, 212 newspapers were published in provincial towns of England, and 8 in Wales. The provincial newspapers of England numbered in 1877 about 980, besides 56 belonging to Wales, and 20 to the islands. About a fifth of the number profess conservative or liberal-conservative principles, a half liberal, a small number perfect independence in politics, and the rest are avowedly neutral. Only a very few of these are conducted with anything like ability. Among the more important are the *Manchester Examiner*, which is understood to have a circulation of 85,000, and the *Newcastle Chronicle* of 36,000, and the *Manchester Guardian*. A characteristic feature of many second-class provincial papers is a column of gossip or scandal, entitled a letter "from our London correspondent."

The newspaper press of Scotland began during the civil wars of the 17th century. A party of Cromwell's troops, who arrived at Leith in 1652 to garrison the citadel, brought with them a printer named Christopher Higgins, to reprint the London paper, *Mercurius Politicus*. The first number was issued on Oct. 26, 1653. and in Nov., 1654, the establishment was transferred to Edinburgh, where the reprinting went on till 1660. On Dec. 31, 1660, the first number was published of the *Mercurius Caledonius*, which professed to furnish information regarding the "affairs in agitation in Scotland, with a survey of foreign intelligence." It lived only three months, and was succeeded by *The Kingdom's Intelligencer*. The *Edinburgh Gazette*, an official paper published by authority, was established in 1669 by James Watson, a printer of eminence and skill. In 1702 Watson also started the *Edinburgh Courant*, which attained its 215th number, and in 1706 the *Scots Courant*. In 1718 the town-council of Edinburgh gave a privilege to James M'Laren to print the *Edinburgh Evening Courant* three times a week. on condition that before publication he should give "ane coppie of his print to the magistrates." This paper still exists as the *Edinburgh Courant*, now a daily paper, and the principal conservative journal in Scotland. The *Caledonian Mercury*, now defunct, was first published April 28, 1720. The *Scotsman*, which came into existence in 1817, under the conduct of Mr. Charles Maclaren, and was for a short time edited by Mr. J. R. M'Culloch, the political economist, is the most influential liberal journal in Scotland, and is believed to have a circulation of 55,000, larger than that of any daily paper out of London. The earliest Scottish provincial newspaper was the *Glasgow Courant*, established in 1715. The *Aberdeen Journal* was founded in 1746 by Mr. James Chalmers; the first number contained an account of the battle of Culloden. The number of newspapers published in Scotland in 1843 was 69: it is now 164, 15 of that number belonging to Edinburgh. A few of the leading newspapers of Scotland contain articles little inferior in talent to those of the best English newspapers, and exercise considerable political influence, at least in matters relating to Scotland. About a score of the Scottish papers are regarded as conservative, 60–70 liberal, and the rest independent or neutral in politics. Edinburgh has in all 12 newspapers, including the weekly issues of the 4 dailies; Glasgow 17 (with 6 dailies); Aberdeen 8 in all; Dundee 4; Paisley 3. The price of most of the daily papers is 1d.; of some it is ½d.; that of the weeklies and bi-weeklies varies from ½d. to 4d.

In Ireland, a news-sheet, called *Warranted Tidings from Ireland*, was printed during the rebellion of 1641; but the first Irish newspaper, properly so called, was the *Dublin Newsletter*, commenced in 1685. *Pue's Occurrences*, a Dublin daily paper, originated in 1700, was continued for half a century. It was followed, in 1728, by another daily paper, *Faulkner's Journal*, established by George Faulkner, "a man celebrated for the goodness of his heart, and the weakness of his head." The oldest existing Dublin newspapers are *Saunders'* (originally *Esdaile's*) *Newsletter*, begun in 1746, and the *Evening Post*, instituted in 1725. The *Limerick Chronicle*, the oldest Irish provincial paper, dates from 1766. Ireland possessed 79 newspapers in 1843, and had in 1877 about 150. Most of them are characterized by an energy of language, and a strength of political bias, unknown in the other parts of the United Kingdom. The *Irish Times* and the *Evening Mail*, published in Dublin, and the *Belfast News Letter*, are influential daily papers.

The Isle of Man supports 1 conservative, 2 liberal, and 1 neutral journal. Jersey has 9 journals, 4 printed in French and 5 in English; 4 are liberal, 1 conservative, 2 liberal-conservative, 1 independent, and 1 neutral. Guernsey has an official gazette printed in French, which is Protestant and neutral, besides 2 liberal, 1 liberal-conservative, and 2 neutral papers. These local papers are conducted with a great amount of spirit and success.

In the British colonies, newspapers are numerous, including those in India, printed in the Bengalee and other native languages. *Hicking's Gazette*, the first Anglo-Indian newspaper, appeared in Calcutta in 1781; it was followed, in 1784, by a small official sheet, the *Calcutta Gazette or Oriental Advertiser*. The still surviving *Bengal Hurkuru* was established in 1795. In the earlier times of Indian newspapers, though there was no direct censorship, exemplary punishment was often inflicted on the authors of offensive paragraphs. In 1794 Mr. Ducane, editor of the *World*, was transported to Europe for an inflammatory address to the army which appeared in his paper; and a similar result followed, in 1798, to another editor, who made some severe observations on the official conduct of a local magistrate. A censorship, established by lord Wellesley, in 1799, was abolished by the marquis of Hastings in 1818; but a license, revocable at pleasure, was required to be taken out by every printer of a newspaper. In 1832 the Indian press consisted of 6 European and 5 native journals. The licensing system was done away with by lord Metcalfe's law of 1835, a step disapproved of by the East India directors, but was again reverted to on the occurrence of the mutiny in 1857. In 1878 an Indian press law tantamount to a censorship was enacted, applicable to the vernacular press only. In 1875 there were in India 135 Eng., 270 vernacular, and 55 mixed newspapers.—The first Australian paper was the *Sydney Gazette*, founded in 1803. Hobart Town had its journal in 1804, and in 1824 newspapers began to multiply in the Australian colonies. The principal are now the *Sydney Herald*, the *Sydney Mail*, the *Argus* of Melbourne, and the *South Australian Register*. The materials for printing this last-named paper were carried out by the original South Australian colonists, the first number having been previously printed in England. A similar course was adopted by the first New Zealand colony in 1839 in founding their *New Zealand Gazette* and *New Zealand Advertiser*. Tahiti has, since 1844, had its *L'Océanie Française*. There is also the *Fiji Times*, the *Fiji Gazette*, and the *Central Polynesian*.

France.—The earliest French newspaper is said to have been established by Théophraste Renaudot, a physician, in the beginning of the 17th century. The first number of his *Gazette* appeared in 1631. In the following year, through interest of cardinal Richelieu, he obtained a royal privilege for his *Gazette;* it was continued weekly up to 1762, and then began to appear twice in the week, and to combine advertisements with public news. Commercial intelligence was added in 1765, and in 1792, theatrical announcements. In 1650 was started the *Gazette Burlesque*, a journal in verse, edited by the poet Jean Loret, devoted in a great measure to the *chronique scandaleuse* of Paris; and in 1672, the *Mercure Galant*, a political and literary journal, which afterwards became the *Mercure de France*, and was continued during the revolution, and down to 1815. The first French daily newspaper was the *Journal de Paris*, which began in 1777, and was discontinued in 1819. A large crop of journals sprang into being with the revolution, organs respectively of republicans, Jacobins, and royalists, but most of them had a very brief existence. Under the first Napoleon the freedom of the press was much restricted. By one of his earliest ordinances as first consul, all the newspapers were suppressed except 13, and under the empire the tolerated journals were allowed to be little more than echoes of the official *Moniteur*. From the danger which attended the handling of political questions, arose the practice of filling a large portion of the sheet with the *Feuilleton* consisting of a sketch or tale by a popular writer, which has ever since been a characteristic of French journalism. During the restoration period, the press being again less fettered, there was a large increase in the number of newspapers. In 1826 there were 127, and in 1829, 307 newspapers published in Paris. The July revolution at first added still further to their number; but the restrictive measures of 1834, consisting in the imposition of a stamp duty, and of an obligation to find security to the amount of 24,000 francs, led to the collapse of a large proportion of the then existing journals. The *Moniteur*, *Débats*, and *Presse* were in possession of the government, and for a time also the *Constitutionnel*, and every shade of political opinion had its recognized organ. Emile de Girardin's scheme of widening the circulation of the government organ, the *Presse*, by bringing down the subscription price from 80 to 40 francs, had the result of reducing the price of the opposition journals also. Cheap newspapers being thus established, it soon appeared that with the class among whom they circulated most widely the *feuilleton* was regarded of more importance than the political article, and it thus became the policy of the journalists to pay enormous sums to the cleverest novelists of the day, in order to retain them in their service; 100,000 francs paid by Dr. Véron of the *Constitutionnel* to Eugène Sue for his *Juif Errant* turned out as profitable a speculation for the journalist as for the novelist. The revolution of 1848, like the revolutions that had gone before it, gave birth to a multitude of short-lived journals. There were 89 different political journals started into ephemeral existence in Paris during the late commune, from Mar. 19 to May 27, 1871. When the late emperor Napoleon was president of the republic, a law was passed obliging the author of every newspaper article to affix his name to it. In Feb., 1852, the press laws were incorporated, with increased stringency, into a *Décret organique sur la Presse*. Louis Napoleon, during the empire, relaxed the stringency a little. The republic holds newspapers in as great bondage as did its imperial predecessor. Among the most important daily papers published in Paris are the *République Française*, *Pays*, *Siècle*, *Presse*, *Débats*, *Bien Public*, *France*, *Journal Officiel*, *Charivari*, and *Figaro*.

Belgium.—In the Low Countries an illustrated war gazette, called the *Nieuwetijdinghe*, was first published in 1605; it was the precursor of the *Gazette van Antwerpen*, which survived till 1805. During the Spanish and Austrian rule, each town had its privileged newspaper, but the press was considerably fettered in the expression of political opinion Under the French rule, most of these journals disappeared or sunk into insignificance The *Annales Politiques* was a political journal of considerable popularity during last century. Since the revolution of 1830, the press has been subject to few restraints, the newspapers have been numerous, and some few of them well conducted. The *Indépendance Belge* has a large circulation, and exercises considerable political influence. It is the property of a company of bankers, and is conducted by a Frenchman of talent and liberal sentiments. The *Moniteur Belge* was instituted as the official organ of the ministry in 1830. *Le Nord*, a Russian organ published in Brussels, is conducted with great ability. A large circulation is enjoyed by the *Journal de Bruxelles*, the *Emancipation*, and the *Etoile Belge*—all papers in the interest of the *parti prêtre*, and supplied with correspondence from Rome. The *Echo de Bruxelles* and the *Journal de Belgique* are independent papers. The *Précurseur d'Anvers*, and the *Escaut* of Antwerp, have a good circulation—the latter is at once ultramontane and ultra-democratic.

Holland.—The earlier newspapers of Holland were in some respects, particularly in the accuracy of their information, in advance of those of other countries, but gave far more prominence to commercial than to political intelligence. They all bore the name of *Courant* appended to the name of the town where they were published. Though subject to no censorship since 1815, it was not till 1830 that they began to comment on political occurrences. At present the principal Dutch journals are the *Allgemeene Handelsblad* of Amsterdam, and *Amsterdam Courant;* the *Harlemsche Courant;* and the *Journal de la Haye, De Nederlandsche Stoompost*, and *Staats Courant*—published at the Hague.

Switzerland.—Switzerland being a confederation of states, each with its own institutions, the Swiss newspapers have a very local character; but they are numerous, and some of them have of late years greatly improved in character. The *Swiss Times*, published in Geneva, and printed in both French and English, is now frequently quoted in all countries.

Germany.—Though in Germany the *Relationen*, above alluded to, were in some sort the precursors of newspapers, yet no serial newspaper, properly so called, seems to have existed till 1615. Frankfort was the first town that possessed its journal; next followed Fulda, Hildesheim, and Herford. The earliest Leipsic newspaper was instituted in 1660. The first newspaper with a staff of foreign correspondents was the *Hamburgsche Correspondent;* but no German newspaper can be said to have had any political weight till the institution of the *Allgemeine Zeitung*, founded by Cotta in 1798, now published at Augsburg, which still takes rank as the first paper in Germany. During French ascendency, the German papers were little more than echoes of the Parisian; but a number of journals of a more national character sprung up during the war of liberation. The abuse of the liberty of the press after 1830 led to the imposition by the diet of restrictions of a somewhat severe character on newspapers. Although within the last 20 years there has been a decided improvement in the literary and political character of the German newspapers, the socialist law of 1878 is a severe restriction of the liberty of the press. Among the principal Berlin daily papers are the *Vossische Zeitung*, the *Norddeutsche Allgemeine Zeitung* (semi-official), the *Neue Preussische Zeitung* (usually known as the *Kreuz Zeitung*), *Post*, *National-Zeitung*, and *Volks-Zeitung*. The *Allgemeine Zeitung*, published at Augsburg, is a very influential and well-conducted journal.

Austria.—The Austrian newspapers have partaken of the advance in the newspaper press of Germany. The most important of them is the *Wiener Zeitung*, with its evening reprint, the *Wiener Abendpost*, not insignificant either in a literary or political point of view, and the *Neue Freie Presse*.

Italy.—We have mentioned the early *Notizie Scritte* or gazettes of Venice. The news-sheets which followed them were in disfavor with the see of Rome: and a memorable bull denouncing them was issued by Gregory XIII. Up to 1847 the newspapers of Italy were small, politically insignificant, and subject to a strict censorship. With the accession of pope Pius IX., a flood of political journals made their appearance, one or two of which only were conducted with any approach to talent, and few lasted above a year. In the Sardinian dominions there continued to be no fewer than 45 political papers published in 1852, 41 of which were printed in Italian and 4 in French. Of that number a great many soon afterwards collapsed. The removal of the former restrictions of the press in other parts of the kingdom of Italy has started into life a number of newspapers. 17 political and 10 partially political papers are now published in the dominions of Victor Emmanuel, besides 81 periodicals, many of which answer more or less to our ideas of a newspaper. Few of these newspapers are as yet of much promise. The leaders are poor, no great social or commercial questions are discussed, and each journal is the mere advocate of one or other of the political parties. Perhaps the best of them on the whole are *Il Diritto* and *L'Opinione*, which may be compared to some of the second-rate French papers. The *Gazetta Ufficiale del Regno d'Italia* is the ministerial organ, and *L'Italie*, published in France, is looked upon as the organ of the department of foreign affairs. Humorous newspapers, after the model of our *Punch*, are abundant The *Voce della Verita* is the paper which advocates the cause of the pope. *La Liberta* and *Il Fanfulla* are published in Rome; Genoa issues its *Carrière Mercantile;* Milan, *La Perseveranza;* and Naples, the *Pungolo* and *Patria.*

Spain.—Sheets called *Relaciones*, giving accounts of important occurrences, used to appear in Spain at irregular intervals in the 17th c., occasionally in the form of romances; but no Spanish newspaper, properly so called, existed till last century, and 50 years ago Madrid possessed but one journal. The first approach to political journalism followed in the wake of the peninsular war and the establishment of the cortes. The gross license with which many of the then established papers were conducted, led, in 1824, to the suppression of all except the *Diario* and *Gaçeta* of Madrid, the *Gaçeta de Bayona*, and a few which were purely commercial or scientific. At present, about 40 journals are published in Madrid, politically and in every other respect very unimportant; the most read is the *España.* The press of Portugal is as insignificant as that of Spain: the official organ is the *Diario do Governo.*

Sweden and Norway.—The earliest Swedish newspaper seems to have been the *Ordinarie Post Tidende*, established in 1643, and continued till 1680. It was followed by the *Relationes Curiosæ* in Latin (1682–1701). Two French papers, the *Gazette Française de Stockholm* and the *Mercure de Suède*, existed in Sweden in the second half of last century, but politically the newspaper press cannot be said to have had any influence until the establishment of the *Argus* by Johanssen in 1820. For a number of years the principal journals of Sweden were the *Fäderneslandet*, the organ of the royalists, and the *Aftonbladet*, that of the reformers. The latter, on king Oscar's accession, ceased to be an opposition journal. The official paper is the *Post och Inrikes Tidningar.* Every provincial town has now its journal, and there are about 114 newspapers in all published in Sweden. Of the Norwegian papers the oldest is the *Christiania Intelligentssedler*, founded in 1763. *Den Constitutionelle* is the government journal, and *Den Morgenblad* the organ of the opposition.

Denmark.—In Denmark journalism is still more recent. Up to 1830 only two newspapers were published in Copenhagen, both entirely made up of extracts from foreign journals. Since 1834 there has been an improvement in the character and increase in the number of the Danish journals. They numbered 86 in 1849. The oldest newspaper now existing in Denmark is the semi-ministerial *Berlingske Tidende*, founded in 1749. The *Fädrelandet* is the journal of the Scandinavian popular party.

Russia.—The earliest newspapers in Russia were published under the personal surveillance of Peter the great, first in Moscow and afterward in Petersburg, to report the progress of the war with Sweden. Political journalism, properly so called, has, however, never flourished in Russia, and has, in fact, only been allowed in important political crises—as the French invasion of 1812, the Polish insurrection of 1830, and recently during the Crimean war, when the journalists were allowed to exercise their ingenuity in defending the government policy. The largest circulation was at that time attained by the *Sjéwernaja Ptsch'eta*, or *Northern Bee*, which had its feuilleton. Generally speaking, the Russian newspapers occupied themselves with scientific and literary subjects rather than public or political news. The *Journal de St. Petersbourg*, in French, is the organ of the court, and has considerable circulation out of Russia.

Turkey.—The first newspaper in Turkey was founded in 1795 by M. Verminhac, envoy-extraordinary of the French government to the court of Selim III., and printed in French at Pera. A Frenchman of the name of Blacque established at Smyrna, in 1825, the *Spectateur de L'Orient*, afterwards the *Courrier de Smyrne*, which had considerable political influence during the Greek war. The same M. Blacque afterwards edited the official journal of the porte, called the *Moniteur Ottoman*, which has, since 1832, been reprinted in Turkish under the name of the *Taquîmi Vaqâi.* The *Taquîmi* was till lately a very badly printed sheet, but it has much improved, and now issues weekly instead of monthly, sometimes containing very fair literary and political articles. But the most important Turkish paper is the *Djeridei Havadis*, founded in 1843 by Mr. Alfred Churchhill, an Englishman born in Turkey. It embraces a great variety of matter, a court gazette, official appointments, home and foreign news, advertisements, prices of stocks, and a feuilleton. There are besides in Constantinople two new and popular papers, called the *Terguman Ahwal*, or *Interpreter of Events*, published three times a week, and the *Tas Veeri Evkiar*, or *Mirror of Thoughts*, published twice a week. The latter has a scientific and literary repute. The Turkish papers have no leading articles, and from the constitution of political society in Turkey, there can be no avowed opposition to the policy of the government. The *Courrier de Constantinople*, in French, is one of the principal journals of the capital; here appear also the *Levant Herald* and the *Levant Times* in English. And papers in French, Italian, Greek, and Armenian are published in various parts of the empire.

Greece.—Various newspapers in modern Greek appeared at Paris and Vienna before Greece obtained her independence; but the first political published in Greece was the *Hellēnikē Salpigx*, founded in 1824, and soon followed by the *Hellēnika Chronika* and *Hellēnikos Tēlegraphos* in Missolonghi, the *Philos tou Nomou* at Hydra, the *Ephēmerides Athenaikai* at Athens, and the official *Genikē Ephēmeristēs Hellados* published at Nauplia, with its opponent the *Apollōn*, which afterwards became the *Athēna.* Most of these papers disappeared in 1833 on the system of sureties being introduced. The *Sōtēr* was established as the government organ in 1833. Upwards of eighty newspapers are now published in Greece, the largest number of them in Athens. Of these several appear in in French, Italian, and English. The leading political journal of Athens is the semi-monthly *Spectateur d'Orient;* but generally speaking, the Greek papers make no endeavor to lead the parties in the state.

United States.—In America the earliest newspaper was the *Boston Newsletter*, founded in 1704, insignificant in size and contents, and conducted by John Campbell, the postmaster of the town. A rival to it appeared in 1719 in the *Boston Gazette,* "published by authority." The *Boston Newsletter*, however, throve in spite of opposition. With the name changed to the *Massachusetts Gazette and Boston Newsletter*, it was the support of the British rule against the desire for independence, and ceased to appear when the British troops evacuated Boston. The *New England Courant*, established in 1721, was at first printed by James Franklin, and afterwards edited by his brother the famous statesman. It lasted but six years, but a subsequent newspaper, entitled the *Pennsylvania Gazette,* was started by Benjamin Franklin in 1729, and continued weekly till 1745, when it merged in the *North American.* *Ede's Boston Gazette,* begun in 1755, was for a long time the chief organ of the popular party; in it appeared John Adams's "Letters of Novanglus." The *Massachusetts Spy* was another paper of note on the revolutionary side. It was afterwards removed from Boston to Worcester, and still appears as the *Worcester Spy.* At the revolution the New England colonies possessed 14 newspapers; Pennsylvania, 9; New York, 4; and the middle and southern colonies, 10. All save the semi-weekly *Advertiser* of Philadelphia were published weekly. The development of the newspaper trade has kept pace with the advancing prosperity of the country. In 1800 the number of newspapers had increased to 200, of which several were daily papers. In 1810 there were 359, including 27 daily sheets. In 1828 852 papers appeared; in 1850 no less than 2,526; while in 1870 there were 5,871 newspapers, with a circulation of 20,842,475, and a yearly issue of 1,508,250. In 1874 the number of weekly papers had reached 5,544, besides the weekly issues of 678 daily papers. Some of the New York weeklies have an enormous circulation, the *Ledger* having occasionally sent out upwards of 400,000 copies. The Germans publish 310 papers in their own tongue; the Scandinavians, 19; Spaniards, 16; Italians, 2; Welsh, 4; Bohemians, 5; Poles, 2; Portuguese, 1; while there is a Chinese newspaper published at San Francisco, and a Cherokee one at Tahlequah in the Indian territory. About 275 periodicals, with a supposed aggregate circulation of 65,000,000 copies, are issued in the United States. Among the leading newspapers of New York, in the order of importance, both as to enterprise and circulation, is the *New York Herald*, the *Tribune*, and the *New York Times.*

The principal religious papers published in New York are the *Observer* and *Evangelist*, organs of the Presbyterians; *Independent* and *Christian Union*, of the Congregationalists; the *Churchman* is Episcopal; the *Christian Advocate*, Methodist; and the *Examiner*, Baptist. The Unitarians are represented by the *Liberal Christian;* the Catholics by the *Tablet;* and the Swedenborgians and Jews have also their papers.

All the other numerous journals of the American states are, compared with those of New York, accounted provincial, but many are, nevertheless, vigorously conducted. Each county, comprising, on an average, 360 sq.m., has generally two or three papers—one being republican, another democratic, and if there is a third, it is probably the organ of some religious or other sect. The printer is, in most cases, the editor, and the village lawyer supplies leaders seasoned frequently with personal attacks. Some of them have been successfully started with no larger a capital than $100 of borrowed money.

There is an immense collection of newspapers in the British museum, which belonged in part to the library of sir Hans Sloane, in part to that of Dr. Charles Burney. See Andrew's *History of British Journalism* (London, 1859). Grant's *The Newspaper Press; its Origin, Progress, and Present Condition* (London, 1871).

NEWSPAPER (*ante*). See AMERICAN JOURNALISM.

NEWSTEAD ABBEY, the home of the Byrons, about 8¼ m. n.w. of Nottingham. England. It was founded by Henry II. in 1170, as a priory of black canons. When Henry VIII. dissolved the monasteries it was granted to sir John Byron, who made over a part of it into a dwelling, and it has since been subjected to so many alterations and additions that, though originally a fine specimen of the early Anglo-Gothic, it is now a composite of many styles. The fifth lord Byron, the poet's great-uncle, tore down much of the house, felled large tracts of timber, and did what he could to ruin the estate, from hatred for his son the heir, who, after all, did not survive his father. Lord Byron sold the estate in 1817 to col. Wildman for £180,000. Wildman spent over £200,000 in improving it, and preserved all the memorials of the poet, his former schoolfellow, which he found. Newstead abbey is now (1881) the property of William Frederick Webb.

NEW STYLE. See CALENDAR, DATE.

NEW SWINDON. See SWINDON.

NEWT, or EFT, *Triton,* a genus of batrachians of the family ***salamandridæ***. more aquatic in their habits than the salamander, to which, in form and characters, they are very similar, having an elongated body and tail, and four small weak limbs. The tail is vertically compressed, and a crest is often developed on the back and tail, but the crest is characteristic of the males in the breeding season, and the tail becomes rounded when the animals leave the water, as they often do, particularly in the latter part of summer, or in autumn; which, along with other variations apparently dependent on circumstances, have caused no little multiplication of specific names. The most abundant British species is the Common Newt, or Smooth Newt (*T. punctatus, Lissotriton punctatus*, or *Lophinus punctatus*), which is from 3¼ to 4 in. long, brownish gray above, yellowish beneath, spotted with black, with a soft, smooth skin, and two bands of pores on the head; a well-known inhabitant of stagnant pools and ditches, often found also under stones, and in other damp situations. The Warty Newt (*T. palustris*, or *cristatus*), also pretty common, is 5 or 6 in. in length, blackish brown above with round spots of a darker tint, bright orange or orange-yellow with black spots on the under-parts, the sides dotted with white, and the tail often exhibiting a white band, the skin rough or warty, and with many pores. The dorsal and caudal crests of the warty newt are separate; those of the common newt are united. Many other species occur in other parts of the world. They all feed on animal food, of which tadpoles and aquatic insects form the chief portions. They deposit their eggs on the leaves of aquatic plants, each egg separately, twisting or folding the leaf with their feet so as to conceal the egg, which is surrounded by a viscous substance, so that the leaf is retained in this form. The transformation of newts are noticed, and illustrations given, in the article Batrachia. They very frequently change their skin. They possess, in an extraordinary degree, the power of reproducing lost members—a limb, a tail, even an eye—in every respect perfect. Spallanzani, who made many observations on this subject, found that the same member could be reproduced a number of times successively. Newts are also capable of surviving, although long frozen up in ice, and return to activity when a thaw takes place. A strong and almost universal popular prejudice exists against them as most noxious animals, although they are not in the slightest degree venomous. They have recently, however, begun to be more favorably regarded in consequence of the frequency of aquaria, of which they are interesting inmates.—It is a curious fact that Linnæus, contrary to his usual discriminating penetration, confounded newts with lizards, which they resemble merely in form, differing widely in the most important characters. That they are often confounded by the unscientific is not wonderful.

NEW TESTAMENT. See Bible, *ante*.

NEWTON, a co. in n.w. Arkansas, drained by the Buffalo fork of White river, and other branches; 800 sq.m.; pop. '80, 6,127—6,124 of American birth, 5 colored. The surface is undulating, hilly in some portions, and heavily wooded. The soil is mostly fertile, and the principal productions are Indian corn, wheat, and tobacco. Large quantities of butter, honey, and sorghum molasses are made. There are deposits of lead in some portions. Co. seat, Jasper.

NEWTON, a co. in n. central Georgia, bounded on the s.w. by the South river, drained by the Yellow and Ulcofauhatchee rivers, which unite with the South, in the s. portion of the co., to form the Ocmulgee; situated on the Georgia railroad; 300 sq.m.; pop. '80, 13,619—13 of foreign birth. The surface is diversified, and large portions of it heavily wooded with hickory and oak. The soil is fertile, especially near the rivers, and produces good crops of corn, wheat, oats, cotton, and sweet potatoes. Considerable quantities of butter, molasses, honey, and wool are raised. There are a number of tanneries, saw-mills, and manufactories of cotton yarn. Co. seat, Covington.

NEWTON, a co. in n.w. Indiana, adjoining Illinois; bounded on the n. by the Kankakee river, traversed in the s. by Iroquois river, and on the line of the Pittsburg, Cincinnati, and St. Louis railroad. The surface is level, mostly prairie, with swamps in some portions. Beaver lake is situated in the north. The soil is fertile, and produces good crops of Indian corn, wheat, oats, potatoes, and hay. Other staples are cattle and wool. Co. seat, Kentland.

NEWTON, a co. in e. central Mississippi, drained by the Young Warrior, and the branches of the Chickasawha river; on the Vicksburg and Meridian railroad; 560 sq.m.: pop. '80, 13,436—48 of foreign birth, 5,009 colored. The surface is undulating, and heavily wooded. The soil is fertile, and produces good crops of corn, wheat, oats, sweet potatoes, and cotton. Other staples are wool, pork, butter, and molasses. Large numbers of cattle are raised. Co. seat, Decatur.

NEWTON, a co. in s.w. Missouri, bordering on the Indian territory and Kansas, drained by the branches of Grand river and Elk river, and by Waterfall creek, and crossed by the St. Louis and Pacific railroad; 650 sq.m.; pop. '80, 18,948—608 colored. The surface is heavily wooded with hickory, red and white oak, black walnut, and ash. The soil is mostly fertile, and the principal productions are Indian corn, wheat, oats, sweet potatoes, and tobacco. Other staples are cattle, butter, wool, and sorghum molasses. Carboniferous limestone and lead are found. There are flouring and saw-mills, and pig-lead is manufactured. Co. seat, Neosho.

NEWTON, a co. in s.e. Texas, bounded on the e. by the Sabine river, which separates it from Louisiana, and drained by the branches of the Sabine; 850 sq.m.; pop. '80, 4,359—1507 colored. The surface is broken by hills in the n., is more undulating in the s., and heavily wooded with good timber trees. The soil in the hilly portion is sandy and unproductive, but fertile in the lower lands around the rivers. The principal productions are corn, sweet potatoes, and cotton. There are large numbers of cattle; considerable molasses is made. Co. seat, Newton.

NEWTON, a township in Massachusetts, on Charles river, 8 m. w. of Boston. It contains 2 villages, Upper Falls and Lower Falls, with 3 paper-mills, 3 cotton and hosiery factories, a Baptist theological seminary, and 12 churches. Pop. '70, 12,852.

NEWTON (*ante*), in Middlesex co., Mass., bounded on the n., s., and w. by the Charles river; on the Boston and Albany, and the New York and New England railroads; pop. '80, 16,995. It contains, besides the villages mentioned, *ante*, several others, as Newtonville, Newton Center, West Newton, and Auburndale. It is a favorite place of residence for persons doing business in Boston. Its public schools are among the best in the state. A number of private schools, and the Newton theological seminary, founded by the Baptists in 1826, are situated here. There are 27 churches, 2 newspapers, 2 banks, a public library, and a number of private libraries. There are cotton, silk, and paper mills, machine and cordage manufactories, etc. Newton anciently belonged to Cambridge, was incorporated as a town in 1679, and as a city in 1878.

NEWTON, CHARLES THOMAS, b. England, 1816; educated at Oxford. In 1840 he became assistant keeper of the department of antiquities in the British museum, but resigned in 1852, and obtained the appointment of vice-consul at Mytilene, where he went for the purpose of securing some of the antique sculptures known to exist in Asia Minor, and in the Ægean islands. He passed a number of years in the exploration of the archipelago, discovering at Halicarnassus (the modern Budrum) the site of Artemisia's mausoleum. He carried on excavations at Branchidæ and Cnidus, 1856–59. He unearthed many valuable sculptures, which, with a fine collection of ancient vases, coins, and inscriptions, he presented to the British museum. In 1860 he was transferred to the consulate at Rome, and in 1861 he was appointed keeper of Greek and Roman antiquities in the British museum. His wife, an artist of reputation, died in 1866.

NEWTON, GILBERT STUART, 1794–1835; b. N. S.; came to England in 1817, and, after a tour in Italy, became a student at the royal academy, where he made the acquaintance of Washington Irving and Charles R. Leslie. His first works to attract attention were "The Forsaken" and "The Lover's Quarrel," engraved in the *Literary Souvenir* for 1826; both were in the manner of Watteau. In 1830 he painted "Shylock and Jessica;" "Yorick and the Grisette," from the *Sentimental Journey;* and "Abbot Boniface" from the *Monastery*. In 1831 he exhibited "Portia and Bassanio," and "Lear attended by Cordelia." In 1832 he returned to this country, where he married. On his return to England the next year, he was elected to the royal academy, and exhibited a small picture of "Abelard." He also painted "The Vicar of Wakefield," "Macheath," and a few portraits. He was insane for the last two years of his life.

NEWTON, Sir ISAAC, the most remarkable mathematician and natural philosopher of his own or perhaps of any other age, was b. at Woolsthorpe, in Lincolnshire, in the year 1642. That year, remarkable in English history for the breaking out of the civil war between Charles I. and the parliament, is doubly remarkable in the history of science by the birth of Newton and the death of Galileo. The circumstances with which the pursuit of truth, in scientific matters, was at this time surrounded in the respective countries of these great philosophers, were not more different than the characters of the philosophers themselves. Galileo died a prisoner, under the surveillance of the inquisition, "for thinking, in astronomy," as Milton says, "otherwise than the Franciscan and Dominican licensers thought." In England, it had become the practice, and soon became the fashion, through the influence of Bacon and Descartes, to discard altogether the dictates of *authority* in matters of science. The dispositions of the two philosophers were happily suited to the situations in which they thus found themselves. Galileo's was a mind whose strength and determination grew by the opposition it encountered. The disposition of Newton on the other hand, diffident of the value and interest of his own labors, and shrinking from the encounter of even scientific controversy, might have allowed his most remarkable discoveries to remain in obscurity had it not been for the constant and urgent solicitation of his friends that they should be published to the world.

Newton received his early education at the grammar school of Grantham, in the neighborhood of his home, at Woolsthorpe. On June 5, 1661, he left home for Cambridge, where he was admitted as subsizar at Trinity college. On July 8 following, he matriculated as sizar of the same college. He immediately applied himself to the mathematical studies of the place, and within a very few years must have not only made himself master of most of the works of any value on such subjects then existing, but had also begun to make some progress in the methods for extending the science. In the year 1665 he committed to writing his first discovery on fluxions; and it is said that in the same year, the fall of an apple, as he sat in his garden at Woolsthorpe, suggested the most magnificent of his subsequent discoveries—the law of universal gravitation. On his first attempt, however, by means of the law so suggested to his mind, to explain the lunar and planetary motions, he employed an estimate then in use of the radius of the earth, which was so erroneous as to produce a discrepancy between the real force of gravity and that required by theory to explain the motions, corresponding to the respective figures 16.1 and 13.9. He accordingly abandoned the hypothesis for other studies. These other pursuits to which he thus betook himself, consisted chiefly of investigations into the nature of light, and the construction of telescopes. By a variety of ingenious and interesting experiments upon sunlight refracted through a prism in a darkened apartment, he was led to the conclusion that rays of light which differ in color, differ also in refrangibility. This discovery enabled him to explain an imperfection of the telescope, which had not till then been accounted for. The indistinctness of the image formed by the object-glass was not necessarily due to any imperfection of its form, but to the fact of the different colored rays of light being brought to a focus at different distances. He concluded rightly that it was impossible for an object-glass consisting of a single lens to produce a distinct image. He went further, and too hastily concluding, from a single experiment, that the dispersive power of different substances was proportional to their refractive power, he pronounced it impossible to produce a perfect image by a combination of lenses. This conclusion—since proved erroneous by the discovery of the acromatic telescope by Mr. Chester More Hall, of More Hall, in Essex, about 1729, and afterwards, independently, by Mr. Dollond in 1751—turned Newton's attention to the construction of reflecting telescopes; and the form devised by him is the one which, at later periods, reached such perfection in the hands of sir William Herschel and lord Rosse.

It was on Jan. 11, 1671, that Newton was elected a member of the royal society, having become known to that body from his reflecting telescopes. At what period he resumed his calculations about gravitation, employing the more correct measure of the earth obtained by Picard in 1670, does not clearly appear; but it was in the year 1684 that it became known to Halley that he was in possession of the whole theory and its demonstration. It was on the urgent solicitation of Halley that he was induced to commit to a systematic treatise these principles and their demonstrations. The principal results of his discoveries were set down in a treatise called *De Motu Corporum*, and were afterwards more completely unfolded in the great work entitled *Philosophiæ Naturalis Principia Mathematica*, which was finally published about midsummer, 1687.

Shortly before the *Principia* was given to the public, Newton had been called to take an active part in defending the rights of the university against the illegal encroachments of James II. The conspicuous part which he had taken on that occasion procured him a seat in the convention parliament, in which he sat from Jan., 1689, to its dissolution in 1690. In 1696 he was appointed warden of the mint, and was afterwards promoted to the office of master of the mint in 1699, an office which he held till the end of his life. He again took a seat in parliament, in the year 1701, as the representative of his university. Thus engaged in the public service, he had little time left for mere scientific studies—pursuits which he always held of secondary importance to the public duties in which he was engaged. In the interval of public duty, however, Newton showed that he still retained the scientific power by which his great discoveries had been made. This was shown in his solution of two celebrated problems proposed in June, 1696, by John Bernouilli, as a challenge to the mathematicians of Europe. A similar mathematical feat is recorded of him so late as 1716 in solving a problem proposed by Leibnitz, for the purpose, as he expressed it, of feeling the pulse of the English analysts. When in parliament, Newton recommended the public encouragement of the invention of a method for determining the longitude—the first reward in consequence being gained by John Harrison for his chronometer. He was president of the royal society from 1703 till his death, a period of twenty-five years, being each year re-elected. In this position, and enjoying the confidence of prince George of Denmark, he had much in his power towards the advancement of science; and one of his most important works during this time was the superintendence of the publication of Flamsteed's *Greenwich Observations*—a task, however, not accomplished without much controversy and some bitterness between himself and that astronomer. The controversy between Newton and Leibnitz, as to priority of discovery of the differential calculus, or the method of fluxions, was raised rather through the partisanship of jealous friends than through the anxiety of the philosophers themselves, who were, however, induced to enter into and carry on the dispute with some degree of bitterness and mutual recrimination. The verdict of the impartial historian of science must be that the methods were invented quite independently, and that, although Newton was the first inventor, a greater debt is owing by later analysts to Leibnitz, on account of the superior facility and completeness of his method. The details of these controversies, with all other information of the life of this philosopher, will be found admirably collected in the life by sir D. Brewster, who writes with not only an intimate acquaintance with Newton's works, but in the possession of all the materials collected in the hands of his family. Newton died on Mar. 20, 1727, and his remains received a resting-place in Westminster abbey, where a monument was erected to his memory in 1731. A magnificent full-length statue of the philosopher, executed by Roubilliac, was erected in 1755 in the antechapel of Trinity college, Cambridge. This work was assisted by a cast of the face taken after death, which is preserved in the university library at Cambridge. In 1699 Newton had been elected a foreign associate of the academy of sciences, and in 1703 he received the honor of knighthood from queen Anne. Among the best editions of Newton's principal works are the quarto edition of the *Optics* (Lond. 1704), and the quarto edition of the *Principia*, published at Cambridge in 1713.

NEWTON, Isaac, 1794–1858?: b. New York; son of a revolutionary soldier; became a great ship-builder, superintended the construction of more than 90 vessels, and was a naval architect of distinguished reputation. He was the builder of the *Hendrick Hudson* a river steamboat named in honor of the discoverer, and at the time (1851) considered very elegant; also the *New World*, built about the same time, for the navigation of the North river.

NEWTON, John, 1725–1807; b. London; son of a sea-captain; devoted by his mother to the Christian ministry. But her death occurring when he was seven years of age, he was neglected by his father and step-mother, and soon learned the ways of vicious boys with whom he associated. After a little time at a boarding-school in Essex, he went to sea at the age of eleven. During the next six years he was exposed to the influence of atheistical books and companions. Reading Shaftesbury's *Characteristics* he became an infidel. In his 19th year he was unexpectedly promoted to the rank of a midshipman on board the *Havre* man-of-war.. But in his self-will he abandoned the ship while she lay at Plymouth. He was caught, brought back, flogged, and degraded; but became only more hardened. In 1745 he set sail for India as a common sailor. Unable to endure the taunts of his messmates and the frowns of his superiors. he entered at Madeira a Guinea vessel which took him in exchange for another. In six months he left this ship and landed penniless on the African coast near Sierra Leone. He soon found employment in the service of a slave-trader in one of the islands of the Plantanes, and was compelled to perform the most groveling drudgery. In a year the "stout English sailor was transformed into a spiritless, half-naked wretch, suffering under the effects of fever, shivering under the wind and wet of the rainy season, devouring the nauseous roots which he stole by night from the plantations, or the fish which he caught by the sea-shore, and exciting the contempt and even the pity of the meanest of the slaves." In 1747 an English captain arriving at Sierra Leone with orders from his father to bring him home found him "herding contentedly with the negroes in their low pleasures and gross superstitions." He sailed in Mar., 1748. The ship came near foundering in a terrible storm. His mind was awakened to serious thoughts. At the near prospect of death his skeptical indifference and blasphemous defiance deserted him. He prayed, he read the New Testament and Thomas-a-Kempis, and when the ship reached Ireland he was a changed man. In 1750 he married Mary Catlett. Soon afterwards he was appointed commander of an African slaver, and for four years continued in the slave trade, confessing that "he never had the least scruples as to its lawfulness,". though afterwards he labored earnestly to expose its cruelties During the intervals between his voyages while on shore, and on deck at sea, he studied Horace, Livy, and Erasmus. In 1754 a sudden attack of sickness led him to abandon a sea-faring life, and for 8 years he was tide-surveyor at Liverpool. At this time he studied Greek and Hebrew, and the best theological works in Latin. French, and English. In 1764 he was ordained, and appointed curate of the parish of Olney, where he remained 16 years. He entered heartily into the religious views and work of Wesley and Whitefield. At Olney he published *An Authentic Narrative of some Remarkable and Interesting Particulars in the Life of the Rev. John Newton*. Here too he formed an intimate friendship with Cowper, and in connection with him produced the *Olney Hymns*. Most of them were written by himself for the use of his congregation. In 1779 he was presented with the rectory of the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Hau, London, where he remained till his death, continuing to preach three times a week, even when more than four-score years old, and sight, hearing and memory were fast failing. When entreated to stop, he exclaimed, "What! shall the old African blasphemer stop while he can speak?" His labors were very effective, and he contributed much to dispel the religious apathy of that age. His works besides *Olney Hymns*, were *Omicron's Letters; Review of Ecclesiastical History; Cardiphonia*, or *Utterances of the Heart; The Christian Character Exemplified; Letters to a Wife; Messiah*, being 50 discourses on the Scripture passages in the oratorio of the "Messiah;" *Letters to the Rev. William Bull*, and numerous sermons, discourses, tracts, etc. His letters are beautiful specimens of clearness and simplicity, and rich in Christian experience. Though in his preface to the *Olney Hymns* he disclaims all pretension to being a poet, and claims only the "mediocrity of talent which might qualify him for usefulness to the weak and poor of his flock," yet his verses, being as he himself says, "the fruit and expression of his own experience," live in the memory and affection of Christians, and some find a place in our best collections of hymns. He was a leader in the evangelical party in the church of England.

NEWTON, John, b. Va., 1823. He was appointed second lieut. in the corps of engineers, July 1, 1842, on graduating from West Point military academy. where he acted as assistant professor of engineering 1843–46. The construction of fortifications and the improvement of rivers and harbors next employed his time at various points on the Atlantic coast and great lakes, and 14 years of continuous service secured his promotion to the rank of capt. He was chief engineer of the Utah expedition of 1858. All through the rebellion he was in active service, beginning as chief engineer of the department of

Pennsylvania, and later of Shenandoah. Then he was summoned to assist in constructing the defenses of Washington, and had command of a brigade. During the peninsular and Maryland campaigns of the army of the Potomac he was a brig.gen. of volunteers, and took part in the battles of Gaines Mill, Glendale, South Mountain, and Antietam, where he was brevetted lieut.col. Commanding a division, he was engaged at Fredericksburg, in the storming of Marye heights and battle of Salem, and his services at the battle of Gettysburg gave him the rank of brevet col., and the command of the 1st corps. In the invasion of Georgia he led a division of the army of the Cumberland through all the engagements preceding the capture of Atlanta, and Mar. 13, 1865, he was made brevet maj.gen. Since the war he has been occupied it strengthening the defenses of New York harbor, removing the obstacles to navigation at Hell Gate and other portions of the East river, and improving some of the harbors of lake Champlain, the channel between Staten Island and N. J., and the Hudson river. June 30, 1879, he attained the rank of col. in the corps of engineers.

NEWTON, Robert, 1780–1854; b. Roxby, Yorkshire, Eng. He was early brought under the influence of the Methodists, joining that church at the age of 17. In 1798 he was received by the British conference, and in 1803 was appointed to the Glasgow circuit, attending lectures on theology and philosophy at the same time at the university. Most of his time was spent in England and Scotland. In 1812 he was appointed to London, where he soon became distinguished for his eloquence, especially in behalf of the British and foreign Bible society. When he began his missionary work in England there were only 50 Wesleyan missionaries and 17,000 communicants; in a few years through his influence there were 350 missionaries and 100,000 communicants. His services were in great demand in England, Scotland, and Ireland. In Sheffield he did much to check the influence of Paine, which then prevailed among the working classes. From London he was sent to Wakefield, and thence to Liverpool. For 40 years he was known and honored in all the large towns and cities. He was four times elected president of the British conference, and for many years was its secretary. In 1839, at the centenary conference held in Liverpool, he was appointed delegate to the general conference of the Methodist Episcopal church of the United States. He preached in New York, April 26, 1840, to a large audience, and wherever he preached vast crowds were attracted by his eloquence. In Baltimore, where the conference was held, such multitudes gathered to hear him that he afterwards preached in Monument square to an audience, it is said, of 15,000. He published *Sermons on Special and Ordinary Occasions.*

NEWTON, Thomas, an English prelate of the 18th c., was b. at Lichfield, Jan. 1, 1704. He was educated at Westminster school, and afterwards at Trinity college, Cambridge, where he took the degree of M.A. in 1730, in which year also he was ordained priest. After holding several minor preferments, he was made bishop of Bristol in 1761, and died Feb. 14, 1782. Without any remarkable merit, Newton has, one cannot well say how, succeeded in obtaining a place in literary history. His two productions, whose fortunes have surpassed their deserts, are an edition of *Milton's Paradise Lost* (2 vols., 1749), with a memoir of the poet, and critical and explanatory notes; and *Dissertations on the Prophecies* (3 vols., 1754 to 1758). Besides these, he wrote occasional sermons, and a host of scriptural dissertations, the theology of which is reckoned not always "orthodox."

NEWTON-ABBOT, a market t. of England, in the co. of Devon, beautifully situated in a vale on the river Lemon, 15 m. s.s.w. of Eexter. The portion of the town called Newton-Bushel is on the left side of the stream. It has been undergoing considerable improvements within recent years. William of Orange, after landing at Torbay, in 1688, made his first public declaration here. Pop. '71, 6,082.

NEWTON-IN-MAKERFIELD, a thriving manufacturing and market t. of England, in Lancashire, 15 m. w. of Manchester, on the Manchester and Liverpool railway. Two large iron foundries, as well as printing, paper, and sugar works, an oil-distillery, and a brick, tile, and pot manufactory are in full operation. There is a beautiful lake in the town called Newton Mere, which is covered during the summer months with the pleasure-boats of the townspeople. Horse-races are held here in June, and horse and cattle fairs in May and August annually. The election of M.P.'s for South Lancashire takes place in Newton. Cotton and flour mills, iron foundries and glass-works are in operation, and bricks are made. Pop. '71, 8,244.

NEWTON'S RINGS. In his investigations of the colors produced by thin plates of any material, solid, fluid or gaseous, sir Isaac Newton hit upon the following mode of exhibiting the colors produced by a film of air. He took two lenses, one convexo-plane, its convex side having a radius of 14 ft., the other equi-convex, with the radii of its surfaces 50 ft., and laid the first with its plane surface downwards on the top of the second, thus producing a thin film of air between the lenses; the film being thinnest near the center, and becoming gradually thicker outwards. On slowly pressing the upper lens against the under one, a number of concentric colored rings, having the point of contact of the lenses for their center, appeared, and increased in size when the pressure was increased. These rings, or more properly systems of rings, are seven in number, and each of them is composed of a number (ranging from 8 in the first or smallest ring, to

2 in the outermost) of rings of different colors, the colors, though different in each of the systems of rings, preserving the same arrangements as the colors of the spectrum, of which they seem to be modifications; thus, in the second ring the inside color is violet, and the outside scarlet red. The colors are very distinct in the first three systems of rings, but become gradually confused and dull towards the outside, till they almost fade away in the 7th system. The center is deep black. The thickness of the air-film at the center is about half a millionth of an inch, and increases gradually to nearly $\frac{1}{150,000}$ of an inch, when the colors disappear.

NEWTON THEOLOGICAL INSTITUTION, at Newton, Mass.; organized, 1825; the first theological seminary established in the country by the Baptist denomination, and has always been served by professors eminent for learning and piety. The buildings and grounds, valued at $185,000, occupy the summit of a hill commanding a fine view. It has an endowment of over $318,000, and a library of 13,500 volumes. President, rev. Alvah Hovey, D.D., LL.D.

NEWTON-UPON-AYR, a burgh of barony and parish of Scotland, in the co. of Ayr, on the n. side of the river Ayr, and united with the town of that name by three bridges. See AYR. Its population is included in that of Ayr. Newton-upon-Ayr has ship-building docks, roperies, and iron and brass foundries. It exports 100,000 tons of coal annually.

NEWTOWN, a t. in s. New York, on the w. extremity of Long Island, in Queens co.; pop. '70, 10,631. It is on the Flushing, North Shore and Central railroad, and formerly included Hunter's Point and Astoria; within its present limits are the villages of Corona, Maspeth, Columbusville, Glendale, Melvina, Newtown, and Ravenswood. Its n.e. boundary is an estuary of Long Island sound, its w. the city of Brooklyn, and it is bounded on the n.w. by the East river; 5 m. from New York. It has institutions of learning of high order, 22 churches, and a savings bank. Its surroundings offer many attractions. Market gardening is an occupation very generally followed; other industries are the manufacture of rope and oil-cloth, and it has an extensive iron foundry.

NEWTOWN, a modern manufacturing t. of North Wales, in the co. of Montgomery, 8 m. s.w. of the town of that name, on the right bank of the Severn, and on the Montgomery canal, which connects it with the inland navigation of the country. It is the center of the flannel manufactures of the county. It has 40 factories employing in all 960 men. Pop. '71, 5,744.

NEWTOWNARDS, a market t. of the co. Down, Ireland, 12 m. e. from Belfast by railway. Pop. '71, 9,562. It contains a court-house, a town-hall, and a market-square; a Protestant church, a Roman Catholic chapel, seven Presbyterian meeting-houses, numerous schools, and a union workhouse. It is a neat and well-built town, of considerable trade, and with extensive muslin, flax-spinning, and weaving factories. Since the union, it has ceased to be a parliamentary borough. The affairs of the town are administered by commissioners.

NEWTOWN-LIMAVADY (Ir. *Leim-a-madha*, "The Dog's Leap"), a market t. of the co. of Londonderry, Ireland, and 16 m. e.n.e. of the town of Londonderry. Pop. in 1871, 2,762. Newtown-Limavady, in the period anterior to the establishment of English rule, was the seat of the powerful sept of the O'Cahans, or O'Kanes; and during the wars of the revolution it was the scene of more than one struggle between the followers of James II. and those of William. Its chief importance at present is as a center of the flax trade, once the staple of that district, and again rising in importance. It possesses a town-hall, weaving factory, extensive flour-mills, markets, and brewery; union workhouse, Protestant church and other places of worship, and two comfortable hotels.

NEW WESTMINSTER, a t. in central British Columbia, on Fraser's river in the midst of the gold region, the former capital and one of the chief towns of the province; pop. 2,000, including Indians and half-breeds. It is 15 m. above the mouth of the river, 65 m. n.e. of Victoria, and 100 m. from Yale, at the head of river navigation. The river empties into the gulf of Georgia, and steamers from Vancouver island make this place a freight and passenger station for ocean steamers, whence the river steamers forward them to Yale. Between this place and Victoria steamers run twice a week. The river at this point is about a mile wide, and contains several inhabited islands The town is the center of considerable tracts of arable land, delightfully located, has a fine climate and a large rainfall; and the vicinity is a silver producing region, though mines are not yet opened. Its leading industry is salmon fishing, several establishments largely exporting the fish in cans and barrels; and other kinds of fish are caught for this trade, and for the manufacture of fish oil. It has also a large trade in lumber and furs. Anthracite and bituminous coal are exported. It has five churches, good public schools, a Roman Catholic college, a young ladies' seminary directed by the sisters of St. Anne, and a public hospital. It contains a mint and assay office, a council hall, court-house, and public library, a jail and penitentiary. It supports 2 newspapers.

NEW-YEAR'S DAY, the first day of the year. The custom of celebrating by some religious observance, generally accompanied by festive rejoicing, the first day of the year, appears to have prevailed among most of the ancient nations. The Jews, the Egyptians, the Chinese, the Romans, and the Mohammedans, although differing as to the time from which they reckoned the commencement of the year, all regarded it as a day of special interest. In Rome the year anciently began in March; and when Numa, according to the ancient legend, transferred it to Jan. 1st, that day was held sacred to *Janus Bifrons*, who was thus supposed to turn at once back upon the old year and forward into the new. On the establishment of Christianity, the usage of a solemn inauguration of the new year was retained; but considerable variety prevailed, both as to the time and as to the manner of its celebration. Christmas day, the annunciation (Mar. 25), Easter day, and Mar. 1 have all, at different times or places, shared with Jan. 1 the honor of opening the new year; nor was it till late in the 16th c. that Jan. 1 was universally accepted as the first day of the new year. The early fathers—Chrysostom, Ambrose, Augustine, Peter Chrysologus, and others—in reprobation of the immoral and superstitious observances of the pagan festival, prohibited in Christian use all festive celebration; and, on the contrary, directed that the Christian year should be opened with a day of prayer, fasting, and humiliation. The mandate, however, was but partially observed. The festal character of the day, generally speaking, was pertinaciously preserved, but the day was also observed as a day of prayer; and this character was the more readily attached to it when the year began with Jan. 1, as that day, being the 8th after the nativity of our Lord, was held to be the commemoration of his circumcision (Luke ii. 21).

The social observances of the first day of the new year appear to have been in substance the same in all ages. From the earliest recorded celebration, we find notice of feasting and the interchange of presents as usages of the day. Suetonius alludes to the bringing of presents to the capital; and Tacitus makes a similar reference to the practice of giving and receiving new-year's gifts. This custom was continued by the Christian kingdoms into which the western empire was divided. In England we find many examples of it, even as a part of the public expenditure of the court, so far down as the reign of Charles II.; and, as all our antiquarian writers mention, the custom of interchanging presents was common in all classes of society. In France and England it still subsists, although eclipsed in the latter country by the still more popular practice of Christmas gifts. In many countries, the night of New-Year's eve, "St. Sylvester's eve." was celebrated with great festivity, which was prolonged till after 12 o'clock, when the new year was ushered in with congratulations, complimentary visits. and mutual wishes for a happy new year. This is an ancient Scottish custom, which also prevails in many parts of Germany, where the form of wish—"Prosst- (for the Lat. *prosit*) Neu-jahr"—"May the new year be happy"—sufficiently attests the antiquity of the custom. In many places the practice of tolling bells at midnight, and thus "ringing in the new year" is still observed. Many religious communions are wont to celebrate it with a special service. In the Roman Catholic church, the *Te Deum* is still sung at the close of the old year; and New-Year's day is a holiday of strict obligation.

NEW YORK. one of the thirteen original states of the United States of America, now the most important in population and wealth, occupies an irregular triangular area from the Atlantic ocean to the great lakes, lat. 40° 29′ 40″ to 45° 0′ 42″ n., long. 71° 51′ to 79° 47′ 25″ w. The state is 412 m. from e. to w., 311 from n. to s., with an area of 47,000 sq. m., or 30,800,000 acres; bounded n. by lake Erie, lake Ontario, the river St. Lawrence, and Canada; e. by lake Champlain, and the states of Vermont, Massachusetts, and Connecticut, and by the Atlantic ocean, s. by the ocean, New Jersey, and Pennsylvania; w. by Pennsylvania, the Niagara river, and the lakes which make its irregular northwestern boundary. The state has 60 counties. Its chief towns are New York city, Albany (the capital), Buffalo, Rochester, Oswego, Troy, Hudson, Syracuse, Utica, etc. Pop. '70, 4,873,068, of whom 1,000,000 are of foreign birth, 500,000 being Irish, and about 250,000 Germans. New York, though resting only one corner upon the Atlantic, has its sea-coast extended by Long Island, Staten Island, etc., to 246 m.; while it has a lake coast of 352 m., and borders for 261 m. on navigable rivers. The Hudson, broad and deep, with tides flowing 150 m., joins at Albany a system of canals, which connect New York city with the great western lakes and the river St. Lawrence. The state is also traversed by railway-lines in every direction. The center is beautified by many picturesque lakes, and its north-eastern portion and the banks of the Hudson by fine mountain scenery. The Blue Ridge of the Alleghanies form the highlands, whose peaks rise 1500 ft. from the Hudson; n. of these, the Catskills rise to a height of 3,800 ft., with a large hotel for summer visitors at an elevation of 2,000 ft.; while Mt. Marcy and Mt. Anthony, peaks of the Adirondacks, in the wild region w. of lake Champlain, are 5,337 and 5,000 ft. high. The chief rivers, besides the Niagara and St. Lawrence, are the Hudson, its chief branch the Mohawk, the Genesee, and the sources of the Delaware, Susquehanna, and Alleghany. Its geology presents a series of older rocks, from the azoic to the lower members of the carboniferous. Red sandstone of the middle secondary period is found on the borders of New Jersey; drift and bowlders are found everywhere; the great Silurian belt passes along the eastern line, and granite with iron occurs in the n.e. There is no coal, but rich beds of marble near New York city; productive salt-springs in the center of the state, which yielded, in 1874, 6,594,191 bushels; and petroleum and natural gas, enough in some cases to light large villages, in the w. Among the mineral springs, those of

Saratoga and Ballston have a wide reputation. The climate, mild on the coast, is cold in the northern counties. The soil, particularly of the western and limestone regions, is very fertile, producing the finest wheat, maize, apples, peaches, melons, grapes, etc., in abundance. In 1870, New York state produced 5,614,205 tons of hay, 12,178,462 bushels of wheat, 35,298,625 of oats, 16,462,825 of maize, 17,558,681 lbs. hops, 6,692,040 lbs. maple-sugar, 22,769,964 lbs. cheese, 10,599,225 lbs. wool. Among the natural curiosities are the falls of Niagara; of the Genesee, three cascades of 96, 25, and 84 ft. in 2¼ m.; of the Trenton, which falls 200 ft. in 5 cascades; the Taghanic falls, of 230 ft.; and the oft-painted falls of the Cauterskill, 175 and 85 ft., in a gorge of the Catskill mountains. In 1870 there were 36,206 manufacturing establishments, employing 351,800 persons, and a capital of $366,994,320; and in 1875 there were 5,442 m. of railway in the state; the Erie canal is 350 m., and the New York canals together 855 m.; 351 banks of issue have a capital of $124,589,000. In 1870 there were 5,474 churches; 11,678 public schools, attended by 719,181 pupils; 274 classical, professional, and technical schools, including 7 universities, 24 colleges, and 189 academies, with an attendance of 43,728 pupils; and 1068 boarding and other schools, with an attendance of 99,118 pupils. In 1874 the expenditure for teachers and scholars was $11,088,981, and the total number of children at school, 1,234,821. The number of paupers supported during the year ending June 1, 1870, was 26,152, at a cost of $2,661,385. The number of persons convicted of crime during the same period was 5,473, of which 2,000 were foreign born. There were 835 newspapers and other periodicals—87 daily, 518 weekly, 163 monthly, 19 quarterly; but a large number of these are published in the city of New York, and circulated over the union. The number of copies issued annually in the state was 471,741,744. In 1874 there were 1055 newspapers and periodicals.

The earliest explorations of New York by Europeans were in 1609 by Hendrick Hudson, who took possession of the country on the river which bears his name for the Dutch; and by Champlain, a Frenchman, who explored lake Champlain from Canada. It was possessed by the Iroquois, or Five Nations, and the Algonquins. In 1621 the Dutch made a settlement on Manhattan Island, which they bought for $24, and founded New Amsterdam, now New York. In 1664, New York was taken by the English. In the war of independence (1776), Washington was driven from New York city, which was held by the British till the end of the war; but West Point was held, and Burgoyne, after two severe battles near Saratoga, compelled to surrender. The state constitution was adopted in 1777, and has since been repeatedly amended. The governor is elected for three years, 32 senators for two years, and 128 members of assembly for one year. In 1825 the opening of the Erie canal gave a great impetus to trade. Pop. (1800) 586,756; (1820) 1,372,812; (1860) 3,880,735; (1870) 4,382,759.

NEW YORK (*ante*). *History*—While it is claimed that John de Verrazano landed on the coast of New York in 1524, the first white man who is known to have been within the present boundaries of the state, was Samuel Champlain, the French navigator, who set sail down the lake which was named after him, on July 4, 1609, antedating by two months Hudson's discovery from the sea. Champlain, governor of Canada, was on an expedition up the St. Lawrence, when he met a war-party of Hurons, which he and two other Frenchmen joined. July 5, at Crown Point, the Hurons met 200 Iroquois, and defeated them, Champlain shooting their chief with his arquebuse. This was the initiatory act which incurred the enmity of the Five Nations, with whom the French continued at war until the final surrender of their possessions in America. Sept. 9, 1609, Henry Hudson, an Englishman in the employ of the Dutch East India company, sailed his little 80-ton shallop *Half-Moon* into the waters of New York bay, and three days later commenced his voyage up the river to which his name is attached, which he explored to a point between Hudson and Albany. All the land which he discovered was claimed by the Dutch, and named New Netherland; and in 1611 the states-general offered special privileges to any company opening and encouraging trade with the natives of their newly acquired possessions. This encouragement procured not only trading but colonization. In 1613 a fort was built on Manhattan island, but the settlement about it was broken up by the English. In the following year another Dutch colony established itself on the same spot, and continued in possession; and during the ten years succeeding, the shores of the Hudson and those of Long Island sound were explored, and at fort Orange (Albany) another trading-post was established. In this region the Indians were tribes of the great Algonquin family, while the remainder of the state was occupied by the Five Nations. But while Champlain had embroiled himself with the Indians in the part of the country included in his explorations, thus entailing a long and bloody war upon the French, the Dutch settlers in the s.e., more wary, cultivated amity with the red men, to their own material advantage. In 1621 the prospects of a lucrative commerce with America had induced certain merchants in Holland to combine in the organization of the Dutch West India company, for colonization purposes, and two years later this company took out 18 families who settled at fort Orange, and 30 families who remained at New Amsterdam on Manhattan island.

The first important illustration of the benefits of amicable intercourse with the Indians occurred in the purchase from them of Manhattan island by the Dutch in 1626 for the sum of $24. This was accomplished by Peter Minuits, the director-general who had been sent out by the Dutch West India company to take charge of its colonies, an able administrator and wise governor. See MINUITS, PETER. A feature of his administration was the establishment of the patroon system, by which certain speculators were permitted by an act of the company passed in 1629 to gain manorial rights over immense tracts of country; thus building up a powerful land aristocracy, whose influence was great in the early history of the state, and whose claims brought about more than two centuries later the "anti-rent" war between landlords and tenants in these manorial districts. The disturbance which this system immediately produced among the colonists themselves, being attributed wrongfully to maladministration on the part of Minuits, he was summoned home and his office filled, in 1633, by Wouter van Twiller, who was succeeded in 1638 by William Kieft. The administration of the latter was signalized by the first serious difficulty between the colonists and the Indians. Some slight disagreement brought about an attack on the natives by the Dutch, which resulted in the massacre of more than 100 unoffending Indians, men, women, and children, and the precipitation of a sanguinary war which threatened the very existence of the colony. Peter Stuyvesant succeeded Kieft in 1647, and his considerate and judicious direction of affairs relieved the latter from the serious danger into which it had fallen. He pursued a conciliatory policy with the Indians, and the wisdom of his administration soon produced its effect in a satisfactory and progressive condition in the settlements under his jurisdiction. These settlements now constantly extending, soon conflicted with those of the English on the Connecticut river, and of the Swedes on the Delaware. The latter had been established by Peter Minuits, who had joined the service of the Swedish government, after being dismissed from that of the Dutch West India company: in 1655 gov. Stuyvesant seized this settlement by force and annexed it to his government. The English opposition to the Dutch colonization schemes was persistent from the beginning, and fruitful of much conflict. The English claimed the territory n. of Virginia on the ground of the anterior discoveries by Cabot; and in 1664 a charter was granted by Charles II. to the duke of York, which covered all the lands lying between the Hudson and the Delaware, and included New Netherland, as well as lands already held by prior grant, by Connecticut, Massachusetts, and New Hampshire. In the summer of the year in which this charter was given, col. Nicolls was sent from England with sufficient force, and on arriving at New Amsterdam, demanded the surrender of the Dutch possessions. This demand was acceded to by gov. Stuyvesant, who was powerless to prevent its enforcement, and the country in question passed into the hands of the English without a struggle. The name New York was now given both to the settlement on Manhattan island and to the entire province, and that of Albany to fort Orange. A subsequent recapture by the Dutch was followed by speedy restoration to the English; and on the duke of York ascending the throne of England under the title of James II., the province passed into the possession of the crown. Its condition at this time was not encouraging as to progress, either in wealth or education. The most of the land was held by aristocratic families, much of it having been dispensed by the duke of York among his favorites. Heavy taxation and burdensome restrictions on trade bore heavily on the people; there was little political freedom or religious toleration; even under the reign of William and Mary there was little improvement. Colonial possessions, according to the general policy of the European powers, were used to placate or dispose of personal enemies, or to reward personal friends; while their trade was deemed a just perquisite for the royal exchequer. So late as 1689, the persistent tyranny of Nicholson, governor of New York, aroused the colonists to resistance; and Jacob Leisler, a merchant of prominence in New York, and in an official position, seized the government in the name of William of Orange, and held it for two years. He was then superseded by gov. Sloughter, and on very insignificant grounds was tried for high treason, condemned, and put to death. See LEISLER, JACOB.

While the Dutch and English were colonizing s.e. New York and the line of the Hudson river, also at points some distance in the interior and on lake Champlain, the French were incessant in their warfare with the Indians and their inroads from Canada into northern and central New York, varying their warlike expeditions by missionary enterprises. Excepting brief periods of peace, established by treaty stipulations often broken, the French and Indians were constantly at enmity; while the generally friendly relations of the natives with the English resulted in the northern and western frontier settlements being protected by the Indians from French invasion during the French and Indian wars. After 1684, when gov. Dongan concluded an offensive and defensive treaty with the Indians, the English occupied, in peaceful agreement with the latter, the attitude which had been held by the Dutch prior to their ascendency. In 1687 a French army under de Nonville, governor of Canada, invaded New York; the Five Nations, in retaliation, made an invasion of Canada two years afterwards, killing 1000 French settlers, and threatening the destruction of the whole province. On Feb. 8, 1691, at midnight, the town of Schenectady was attacked by French regulars to the number of more than 200, accompanied by a large number of Indians, when 63 of the settlers were killed, and 27 carried into captivity. In 1690-91 the village of La Prairie was twice attacked; and in 1695 count de Frontenac, with 400 Frenchmen and 250 Algonquins, desolated the Mohawk country, and pursued his invasion almost to Albany, returning laden with plunder and prisoners. Lake Champlain was, in fact, held by the French and commanded by their fortifications until 1759. Hostilities between England and France were concluded for the time by the peace of Ryswick in 1697, and from 1702 to 1748, during queen Anne's and king George's wars, there was no fighting in New York, except skirmishes along the frontier. But after the outbreak of hostilities in 1754, there being no concert of action among the colonies, the entire British possessions in North America were threatened with subjugation. The French had fortifications on lake Champlain, on the St. Lawrence, and at Niagara; while the English advanced posts were at fort Edward on the Hudson, and at Oswego. In 1755 the English under sir William Johnson defeated and nearly annihilated the French under Dieskau, at the head of lake George; but in the following year the French captured Oswego and destroyed it, and in 1757 took fort William Henry. In 1758 gen. Abercrombie, with an army of 16,000 men, attacked Ticonderoga, but was repulsed. Col. Bradstreet, however, captured fort Frontenac in the latter year, and in 1759 Niagara was captured by the British, and Ticonderoga and Crown Point surrendered on the appearance of gen. Amherst with his army. This left New York free of the French, and the attention of its people could once more be turned to their own affairs. During the war, and under William Pitt's administration, colonial affairs had been administered less obnoxiously than before; but no sooner was the conquest of Canada completed, than a course of conduct was begun tending to irritate the colonists, and arousing in New York a spirit of opposition whose exhibition the presence of a large royalist force could not prevent.

New York joined earnestly in the arrangements made for self-defense on the part of the colonies. In Oct., 1775, gen. Tryon, the last British governor of New York, fled from his seat of government on board a man-of-war. Already, in May of that year, Ethan Allen and his "Green Mountain boys" had surprised and captured fort Ticonderoga. Generals Montgomery and Schuyler set forth two months later on their ill-fated expedition against Canada—whence they returned defeated and dispirited in the following spring. In Feb., 1776, New York city was occupied by an American force, but the battles of Long Island and Harlem heights, disastrous to the American arms, rendered that position untenable; and, being abandoned by Washington and his army, the British took possession of the city, and held it for 7 years. In the summer of 1777 the province was invaded by gen. Burgoyne from the Canada side, while simultaneously a British force proceeded up the Hudson to unite with him. The immediate result of this joint expedition was the capture by the British of several American forts on the Hudson and lake Champlain, but it ended in disaster, Burgoyne's entire army being forced to surrender, Oct. 17, at Saratoga. In 1777–78 West Point was fortified, and considered the strongest position in the country.

In 1779 the Indian country in New York was laid waste by gen. Sullivan; the Six Nations joined the British, and under sir John Johnson harassed the defenseless settlements on the frontier; and the Schoharie and Mohawk settlements were constantly being subjected to depredations on the part of hostile Indians. Nov. 25, 1783, the final act of the revolution took place in the evacuation by the British of the city of New York, when the colonists were left to frame a government for themselves, which should comprehend the new attitude and larger relations which they held as citizens of a republic. A treaty was now concluded with the Six Nations, the Indians ceding a large portion of their lands to the state. Subsequently other treaties lessened the Indian possessions, until, excepting the reservations, all that they had once owned had been given up to the whites. What was known as the "Holland purchase," 3,500,000 acres sold by Robert Morris to an Amsterdam company—lying west of what was known as the preëmption line, a boundary between New York and Massachusetts lands—having been thoroughly surveyed by its Dutch owners, and made available for settlement, was speedily populated. The lands in central New York were settled as rapidly as the Indians surrendered them. In 1777 the first constitution of the state was adopted, revised in 1801, 1821, 1846, and 1867, the latest amendment having been made in 1874. In the meantime conflicting claims of other states concerning the boundaries of New York had been adjusted amicably; in the case of New Hampshire, by forming the state of Vermont from the disputed territory, New York receiving the sum of $30,000 for relinquishing its claim. The war of 1812 brought the New York frontier again into danger, and a number of engagements occurred in that part of the state bordering on Canada and the lakes. A British attack on Sackett's Harbor, an important American naval station on lake Ontario, resulted unsuccessfully.

Shortly after the close of the war, in 1816, the requisite legislative action was taken for the building of the Erie canal, originally suggested by Gouverneur Morris in 1800. The canal was begun in 1817 and finished in 1825; its successful completion being mainly due to the energy and foresight of gov. De Witt Clinton. The effect of this great work was to enrich the state while opening the way for the stream of commerce which has resulted in making the city of New York the metropolis of the western continent. In 1826 the Hudson and Mohawk railroad was chartered—probably the first railroad charter granted in the country. This road was commenced in 1830, and the New York and Erie in 1836. The gradual absorption of the various New York lines which form the Hudson river railroad, and the consolidation of the New York Central and Hudson river railroad into one powerful four-track trunk line connecting the metropolis with the west, were significant events in the development of the state.

The part taken by the state of New York in the war of secession was foremost, as became the first state in the union in wealth and population. Every county furnished its quota of volunteers; its well-organized and thoroughly drilled militia regiments supplied capable officers to the inexperienced army which was so rapidly formed, and the great manufactories of the state were kept busy night and day in supplying arms, clothing, and equipments; at the Watervliet arsenal alone 1500 men were employed during the war. The wealth of New York was poured out like water to sustain the union cause. The United States sanitary commission and the union defense committee were organized from among its citizens.

Government.—"The Dutch political system made the judiciary supreme, and denied all arbitrary power, either in people or parliaments, in civil rulers or religious teachers, and sought to fortify the people against its exercise. Thus the feudal shell of Dutch government inclosed the seed of liberty, ready in fullness of time to germinate in most perfect form." A government was actually established for the first in New Netherland in 1624, after the arrival of a party of Walloons sent out by the Dutch West India company, under the direction of capt. Cornelis Jacobsen May, who preceded Minuits as director. In 1629 the manorial system was introduced, the patroons being invested with the authority of feudal barons, but no political or judicial changes could be introduced without consent of the home government. In 1638 and 1640 the privileges of the patroons were materially restricted and those of free settlers enlarged. Whenever the people settled in sufficient numbers, the company was obliged to give them local government, the officers of which were to be designated by the director and council, in accordance with the custom in the Netherland. But although by the plan of government "no other religion was to be publicly tolerated or allowed in New Netherland, save that then taught and exercised by authority of the Reformed church in the united provinces,"this provision was a dead letter. English colonists were already settled on Gardner's island, and at Southampton and Southold, at the eastern extremity of Long Island (1639–40), and others in Westchester and at Gravenzande. On the outbreak of the Indian war in 1641, director Kieft invited all the masters and heads of families of New Amsterdam and its vicinity to assemble in the fort on a given day, this being the first official recognition of the existence of the people in New Netherland. When these freemen convened, they gave their opinion on the questions before them, and appointed twelve men to continue to represent their interests. These twelve men proceeded to demand certain reforms of government, but were reminded by the director that they had only been appointed to consider the Indian troubles. They were again called together in 1643, when larger liberties were accorded them, and finally eight men were elected by the director, who became an actual representative body. Gov. Stuyvesant continued this plan, by appointing nine men, who were "tribunes" of the people, to hold weekly courts of arbitration, and advise the director and council. Troubles afterwards grew out of the demands of the tribunes for a burgher government, and these were referred to the states-general for decision, and a more liberal form of government was ordered, to which order Stuyvesant paid no attention. The Dutch governor continued to oppose the efforts of the people for greater liberty, until his forced surrender to the English cut short his prerogative. Under Nicolls and Andros, the people of New York found themselves in a worse position than under the Dutch governors, but gov. Dongan convened the first general assembly of the colony, which passed the act entitled "Charter of Liberties and Privileges granted by His Royal Highness to the Inhabitants of New York and its Dependencies," and by which legislative power was granted to the colony, James II. abolished this general assembly, and endeavored to unite all the colonies as the dominion of New England, under gov. Andros. William and Mary revived the general assembly, and granted to the people of New York a certain degree of freedom; but the struggle between the colonists and the crown continued until the final revolution in all the colonies resulted in the expulsion of English authority. The provincial convention which met in New York, April 20, 1775, was the first organized body in the colony after the overthrow of royal authority, the latter having been declared to have come to an end in the colony on April 19. The first constitution of the state of New York was adopted April 20, 1777. The articles of confederation of the continental congress were ratified by the state, Feb. 6, 1778. The constitution of the United States was ratified by the state July 26, 1787. The present executive government of the state of New York comprises a governor, lieutenant-governor, secretary of state, comptroller, treasurer, attorney-general, state engineer and surveyor, superintendent of the bank department, superintendent of the insurance department, superintendent of public instruction, auditor of the canal department, superintendent of state prisons, superintendent of public works, besides the governor's staff, and various boards and commissions for charity, lunacy, quarantine, etc. The names of the governors of the state from 1777 to 1881, inclusive, in order, are as follows: George Clinton, John Jay, George Clinton, Morgan Lewis, Daniel D. Tompkins, De Witt Clinton, Joseph C. Yates, De Witt Clinton, Martin Van Buren, Enos J. Throop, William L. Marcy, William H. Seward, William C. Bouck, Silas Wright, John Young, Hamilton Fish, Washington Hunt, Horatio Seymour, Myron H. Clark, John A. King, Edwin D. Morgan, Horatio Seymour, Reuben E. Fenton, John T. Hoffman, John A. Dix, Samuel J. Tilden, Lucius Robinson, Alonzo B. Cornell. The legislative branch of the state government includes a senate and assembly; the senate consists of 32 members, elected in November of every alternate year (1881, 1883, etc.), holding their offices for two years from the first of January next succeeding. The state is divided into 32 senatorial districts, each electing one senator. The senators receive an annual salary of $1500, and also $1 for each ten miles of travel in going to or returning from the place of meeting once in each session. Ten dollars per day in addition is allowed when the senate alone is convened in extraordinary session, or when acting as a court for the trial of impeachments. The lieutenant-governor is *ex officio* president of the senate. The assembly consists of 128 members, elected annually by single districts. Each county has at least one member. They receive the same compensation as senators. Their officers are chosen at the opening of the session.

TABLE OF PRESIDENTIAL VOTES, 1824-1880.

Year.	Candidates.	Party.	Popular Vote.	Electoral Vote.	Year.	Candidates.	Party.	Popular Vote.	Electoral Vote.
1824..	Jackson ...	Democrat..	152,899	99	1852..	Scott	Whig	1,383,587	42
1824..	Adams....	Federal....	105,321	84	1852 ..	Hale..........	Free Soil........	157,296	......
1824..	Crawford..	Democrat..	47,265	41	1856..	Buchanan	Democrat........	1,834,337	174
1824..	Clay.......	Republican	47,087	37	1856..	Fremont.......	Republican	1,341,812	114
1828..	Jackson ...	Democrat..	650,028	178	1856..	Fillmore.......	American.......	873,055	8
1828..	Adams....	Federal....	512,158	83	1860..	Lincoln........	Republican......	1,857,610	180
1832..	Jackson ...	Democrat..	687,502	219	1860..	Douglas	Democrat.......	1,365,976	12
1832..	Clay.......	Whig	550,189	49	1860..	Breckenridge..	Democrat.......	847,953	72
1832..	Floyd......	Whig	....	11	1860..	Bell...........	Union..........	590,631	39
1832..	Wirt.......	Whig	....	7	1864..	Lincoln........	Republican......	2,223,035	216
1836..	Van Buren.	Democrat..	771,978	170	1864..	McClellan......	Democrat.......	1,811,754	21
1836..	Harrison ..	Whig	769,350	73	1868..	Grant..........	Republican......	3,013,188	214
1836..	White	Whig		26	1868..	Seymour	Democrat.......	2,703,600	80
1836..	Webster...	Whig		14	1872..	Grant..........	Republican......	3,596,742	292
1836..	Mangum ..	Whig ...		11	1872..	Greeley........	Dem. Liberal....	2,834,898	66
1840..	Van Buren.	Democrat..	1,128,303	60	1872..	O'Conor.......	Straight Dem...	29,486	......
1840..	Harrison ..	Whig	1,274,208	234	1872..	Black..........	Temperance	5,608	......
1840..	Birney.....	Liberty ...	7,609	......	1876..	Hayes..........	Republican......	4,033,665	185
1844..	Polk.......	Democrat..	1,329,013	170	1876..	Tilden.........	Democrat.......	4,285,590	184
1844.	Clay	Whig	1,231,643	105	1876..	Cooper	Greenback......	82,158	......
1844..	Birney.....	Liberty....	66,304	......	1876..	Smith..........	Prohibition......	12.499	......
1848..	Taylor.....	Whig	1,362,242	163	1880..	Garfield	Republican......	4,436,638	214
1848..	Cass.......	Democrat..	1,223,795	107	1880..	Hancock	Democrat.......	4,443,425	155
1848..	Van Buren.	Free Soil...	291,378	......	1880..	Weaver........	Greenback......	314,394	......
1852..	Pierce	Democrat..	1,585,545	254	1880..	Dow............	Prohibition......	10,487	......

Geography.—The outlines of the state are exceedingly irregular, but its river, lake, and ocean boundaries are nearly all navigable, including 852 m. on the lakes; 281¼ m. on the St. Lawrence, Poultney, Hudson, Kill van Kull, Delaware, and Niagara rivers; and 246 m. on Long Island sound and the Atlantic ocean. The total extent of the boundary-lines on the border of Canada, Vermont, Massachusetts, Connecticut, New Jersey, and Pennsylvania is 541.28 miles. The chief harbors are New York bay and harbor; Dunkirk and Buffalo, on lake Erie; Tonawanda and Lewiston, on Niagara river; Genesee, Sodus, Oswego, Sackett's Harbor, and Cape Vincent, on lake Ontario; Ogdensburg, on the St. Lawrence; Rouse's Point, Plattsburg, and Whitehall, on lake Champlain; and Sag Harbor, at the e. end of Long Island, with other harbors on the n. and s. shores of that island. The principal rivers are the Hudson, Mohawk, Oswego, Allegnany, Susquehanna, and Delaware, with numerous branches and tributaries. The state is noted for the number and beauty of its lakes, among which are Chautauqua, Cattaraugus, Hemlock, Honeoye, Canadice, Conesus, Crooked, Canandaigua, Seneca, Cayuga, Owasco, Skaneateles, Cross, Onondaga, Otisco, Cazenovia, Oneida, Otsego, Schuyler, Schroon, George, Avalanche, Colden, Henderson, Sandford, Eckford, Racket, Forked, Newcomb, Long, Saranac (upper and lower), Tupper's, Rich, Pleasant, besides the great lakes and lake Champlain. Three mountain ranges, entering the state from the s., cross it in a n.e. direction. The first of these, a continuation of the Blue Ridge, runs through Rockland, Orange, Putnam, and Dutchess counties, and forms the highlands of the Hudson. Its highest peaks are Beacon hill, Dutchess co., 1685 ft.; Bull hill, Putnam co., 1586 ft.; Butter hill, Orange co., 1529 ft.; Old Beacon, Putnam co., 1471 ft.; Crow Nest, Orange co., 1418 ft.; Bear Mount, Orange co., 1350 ft.; Anthony's Nose, Putnam co., 1228 feet; and Breakneck, Orange Co., 1187 ft. The second range extends through Sullivan, Ulster, and Greene counties, terminating in the Catskill mountains on the Hudson. Its highest peaks are Round Top, 3,804 ft.; High Peak, 3,718 ft.; and Pine Orchard, 3,000 ft.—all in Greene co.; and Rockland mount, 2,400 ft., and Walnut hill, 1980 ft., in Sullivan county. The Shawangunk mountains are the extreme e. spur of this range, and the Helderberg and Hellibark mountains extend from it north into Albany and Schoharie counties. The third range extends through Broome, Delaware, Otsego, Schoharie, Montgomery, and Herkimer counties to the Mohawk; and reappearing on the n. side of that river, continues to lake Champlain, forming the Adirondack mountain region. Geographically, the Adirondack region is bounded by lake Champlain, the St. Lawrence, the Mohawk, and the Black rivers. This extensive territory contains the only great forests remaining as a public domain within the borders of the state. The first surveys of this territory were made in 1772, but it was precisely 100 years later that a systematic topographical survey of the entire region was undertaken by acts of the legislature. The Adirondacks are geologically described as "igneous, plutonic mountains—the rocks generally metamorphic, granite, and gneiss, with feldspar and hornblende." The principal peaks are mount Marcy, 5,402 ft.; mount Clinton, 4,937 ft.; MacIntyre, 5,106 ft.; Wight; Skylight, 4,997 ft.; Haystack, 5,006 ft.; Colden; Dix; Blue; Gothic, 4,744 ft.; Giant of the Valley, 4,530 feet. The lake and river levels here have an altitude of 1500 to 2,000 ft., and the climate is much more severe than in the lowlands of the same latitude. Here are extensive beds of iron ore, some of which have been worked: the average annual yield of the entire region is 30,000 tons. The fauna of the Adirondacks is very rich, affording the panther, lynx, sable, ermine, deer, black bear, rabbits, squirrels, and birds in large variety. This part of the state is accessible from Saratoga by the Adirondack railroad, and stage from North creek to Blue Mountain lake; thence by small steamboats to Raquette lake; also from Plattsburg to the Saranac lakes by railroad and stage.—Of cataracts in the state, Niagara Falls, in the outlet of the four great upper lakes, are 164 ft. high and 1100 wide on the American side, and 2,000 ft. wide on the Canadian side; the total descent being 333 ft., and the width of the river below the falls 1000 feet. The Genesee river has a descent of 260 ft. in three falls within the space of two miles near its source, and there are other falls near Rochester with a descent of 200 feet. Trenton Falls are a succession of five cascades, having 200 ft. of fall in a course of two-thirds of a mile. Cohoes and Little Falls, in the Mohawk, form grand cataracts in times of freshet. In the Catskills a small stream is precipitated down a ledge 180 ft. high.—The water-shed that separates the n. from the s. drainage of w. New York extends in an irregular line through the southerly counties. The country s. of this water-shed, embracing the most of the two s. tiers of counties, is nearly all a hilly country. North of the water-shed the surface descends in rolling and smooth terraces toward lake Ontario, the region between the hills of the s. and the level lands of the n. being a beautiful, rolling country. The river system of the state comprises that part drained by the great lakes and the St. Lawrence, northerly, and that drained by the Hudson and other rivers, southerly. The water-shed between extends irregularly from lake Erie eastward through the s. tier of counties to the Adirondack mountains, lake George, and the state line, east.

Agriculture.—Most of the crops and fruits of the temperate zone can be raised in New York. More than half of the total area of the state is improved, and under successful cultivation.

TABLE OF VALUES OF FARM PRODUCTS FROM THE U. S. CENSUS OF 1870, AND THE AGRICULTURAL REPORT OF 1874.

Crops, etc.	Census of 1870.	Report of 1874.	Crops, Stocks, etc.	Census of 1870.	Report of 1874.
Value of farms	$1,272,857,766	…………	Tobacco for year, lbs	2,349,798	1,593,000
Value of farming implements, etc	45,997,712	…………	Maple sugar for year, lbs	6,692,040	25,423,000
Value of farm products for year	253,526,153	…………	Sorghum and maple syrup, gallons	53,880	…………
Animals slaughtered or sold for slaughter	28,225,720	…………	Irish potatoes, bushels	28,547,593	…………
Home manufactures	1,621,621	…………	Peas and beans, bushels	1,152,541	…………
Forest products	6,689,179	…………	Beeswax, lbs	86,333	…………
Market-gard'n products	3,432,354	…………	Honey, lbs	896,286	…………
Orchard products	8,347,417	…………	Value of all live stock	$175,882,712	$153,006,101
Wages paid for farm labor, including board	34,451,362	…………	Number of horses	856,241	665,800
Wheat for year, bushels	12,178,462	9,161,000	Number of mules and asses	4,407	18,500
Rye for year, bushels	2,478,125	1,834,000	Number of milch cows	1,350,661	1,467,000
Ind'n corn for y'r, bush	16,462,825	16,807,000	Number of working oxen	64,141	669,900
Oats for year, bushels	35,293,625	30,302,000	Number of other cattle	671,428	
Barley for year, bushels	7,434,621	6,463,000	Number of sheep	2,181,578	1,996,400
Buckw't for year, bush	3,904,030	2,917,000	Number of swine	518,251	…………
Flax for year, lbs	3,670,818	…………	Dairy products, butter, lbs	107,147,526	…………
Wool for year, lbs	10,599,225	…………	Dairy products, cheese, lbs	22,769,964	586,300
Hops for year, lbs	17,558,681	…………	Milk sold, gallons	135,775,919	…………
Hay for year, tons	5,614,205	5,291,800	…………		

The yield of the various crops for the year 1879 was as follows:

PRODUCTS.	Quantity produced.	Ave. yield per acre.	No. of acres in each crop.	Value per bush., lb., or ton.	Total Valuation.
Indian corn, bushels	22,704,000	33	688,000	61	$13,849,440
Wheat, bushels	10,746,000	15	716,400	1.40	15,044,400
Rye, bushels	2,770,300	13	213,100	75	2,077,725
Oats, bushels	39,928,000	31	1,288,000	40	15,971,200
Barley, bushels	6,200,000	25	248,000	72	4,464,000
Buckwheat, bushels	5,152,000	20	257,600	54	2,782,080
Potatoes, bushels	38,407,200	104	369,300	36	13,826,592
Tobacco, lbs	2,432,750	1315	1,850	12	291,930
Hay, tons	6,156,000	1.16	5,306,897	9.79	60,267,240
Total	…………	…………	9,089,147	…………	$128,574,607

TABLE SHOWING THE AVERAGE YIELD PER ACRE, AND THE PRICE PER BUSHEL, POUND, OR TON, OF FARM PRODUCTS, FOR 1879.

Corn.		Wheat.		Rye.		Oats.		Barley.		Buckwheat.		Potatoes.		Tobacco.		Hay.	
Bushels.	Price per bushel.	Bushels.	Price per bushel.	Bushels.	Price per bushel.	Bushels.	Price per bushel.	Bushels.	Price per bushel.	Bushels.	Price per bushel.	Bushels.	Price per bushel.	Pounds.	Price per pound.	Tons.	Price per ton.
33	.61	15	1.40	13	.75	31	.40	25	.72	20	.54	104	.36	1315	12	1.16	9.79

The average cash value per acre of the principal crops taken together, being $14.15.

TABLE SHOWING ESTIMATED TOTAL NUMBER AND TOTAL VALUE AND AVERAGE PRICE OF LIVE STOCK, JANUARY, 1880.

HORSES.			MULES.			MILCH COWS.		
Number.	Average Price.	Value.	Number.	Average Price.	Value.	Number.	Average Price.	Value.
898,900	$76.41	$68,684,949	11,600	$91.84	$1,068,712	1,431,700	$29.06	$41,605,202

OXEN AND OTHER CATTLE.			SHEEP.			HOGS.		
Number.	Average Price.	Value.	Number.	Average Price.	Value.	Number.	Average Price.	Value.
668,600	$26.22	$17,530,692	2,205,800	$3.57	$7,874,706	936,000	$7.16	$6,701,760

AVERAGE WAGES FOR 1880.

PER MONTH.		PER DAY.								
By the year.		Transient in Harvest.		Transient not in Harvest.		Carpentering.	Blacksmithing.	Wheelwrighting.	Machine making.	Shoemaking.
Without Board.	With Board.	Without Board.	With Board.	Without Board.	With Board.	Without Board.	With Board.	Without Board.	With Board.	Without Board.
$20.80	$13.98	$1.60	$1.90	$1.08	$0.74	$1.98	$1.80	$2.06	$2.08	$1.70

The average value per acre of cleared lands in New York in 1880 was $58.48; the average value of timbered lands, $40.88; the average increase in value of both classes in one year being 4.7 per cent.

In the northern counties and the highland regions along the s. border and upon the Hudson, stock and sheep raising and dairy farming are pursued; while the lowlands that form the greater part of the surface of the w. portion of the state are best adapted to grain growing. Broom corn has long been the staple crop of the Mohawk valley intervals, tobacco being extensively raised in the Chemung valley and parts of Onondaga and Wayne counties; hops have been an important crop in Madison, Oneida, Otsego, and Schoharie counties; grapes have been successfully cultivated in the valley of the Hudson below the highlands, on the n. shore of Long Island, and in several of the lake valleys in the central part of the state. Maple sugar is an important product of northern and central New York; and fruits, including apples, peaches, pears, and strawberries, are largely grown in the western counties n. of the water-shed; while latterly peaches have begun to be an important crop in Ulster county. Large tracts of land in the vicinity of New York city, and particularly on Long Island, are devoted to market gardening and dairying, and the inhabitants supply milk, butter, cheese, eggs, vegetables and small fruit to the markets of the metropolis.

The climate of New York is varied, with a range wider than any other state. Those portions which are under the influence of the ocean, sound, and lake winds, are more even in temperature, and suffer less severely from the late frosts of spring and the early frosts of autumn, and from summer heats, than portions of the country in the same latitude not thus influenced. The mean temperature of the state, as determined from observations made during 25 years, is 46.49°. The mean length of the season of vegetation from the first blooming of apples to the first killing frost is 174 days; though on Long Island it is 12¼ days longer, and in St. Lawrence co. 22 days shorter. The mean annual fall of water in rain and snow is 40.98 inches.

The principal mineral and medicinal springs of the state are the salt springs of Onondaga co., from which more than 7,000,000 bushels of salt are made annually; Saratoga springs; New Lebanon, and Stockport, Columbia co.; Massena, St. Lawrence co.; Richfield, Otsego co.; Avon, Livingston co.; Clifton, Ontario co.; Sharon, Schoharie co.; Chittenango, Madison co.; and Alabama, Genesee county.

Geology.—With few exceptions the later rock formations are not represented in New York, but a very complete series of the older groups are found, from the azoic up to the lower members of the carboniferous. From n.e. New Jersey, extending over Rockland co., and terminating at the trap formation known as the Palisades, on the w. side of Tappan bay in the Hudson, is the red sandstone of the middle secondary. On the borders of the St. Lawrence and lake Champlain are some tertiary deposits of the pliocene period; and the drift or bowlder formation overruns the whole state, being developed over Long Island in beds of sand, gravel, and clays, so deep that the rocky ledges are everywhere concealed from sight, except at a few points where the gneiss is laid bare on the shore of the East river opposite New York island. The great metamorphic belt of the eastern states passes into New York all along its eastern line, and to the n. of the Mohawk river branches off over nearly all the rough country lying between lakes Ontario and Champlain. In this district are the Adirondack mountains. The granitic and hypersthene rocks of which they consist spread almost to the St. Lawrence, from which the tract is separated by a belt of the Potsdam sandstone, which passes through Potsdam in St. Lawrence co., and surrounds the great district of azoic rocks on its n. and w. sides; and next to this, bordering the St. Lawrence, the calciferous sand-rock overlies the Potsdam sandstone. The birdseye, Black river, and Trenton limestones of the next upper group of rocks lie in Jefferson co. on the e. end of lake Ontario, and along the s.w. border of the azoic district through Lewis co. and into Herkimer county. The region thus surrounded is the great iron-ore district of n. New York. Beds of magnetic and specular iron ores are worked near lake Champlain and in the s.w. part of St. Lawrence co.; and in the latter neighborhood are also the most promising lead mines e. of Wisconsin. The region e. of the Hudson river consists of the lower members of the New York system of rocks more or less metamorphosed, the sandstone passing into quartz rock; blue stratified limestone into the crystalline and white marbles; and the argillaceous slates of the Hudson river group into silicious, talcose, and micaceous slates. The unaltered Silurian rocks cross the Hudson river in a belt reaching from the lower corner of Dutchess co. to Rondout in Ulster co., and extend into the n.e. portion of New Jersey. The metamorphic formations, comprising the slates and gneiss with occasional beds of crystalline limestone or marble, occupy the counties of Putnam and Westchester, and the s.e. portion of Orange county. New York island consists of gneiss, and the same formation extends across Staten island, and reappears in the neighborhood of Trenton, N. J. Along its s.e. half this formation is covered by the secondary red sandstone, which from Tappan bay crosses Rockland co. and New Jersey into Pennsylvania. This group contains valuable beds of hematite iron ore. In the highlands are also many beds of magnetic iron ore, and there are numerous beds of white marble. It is in the Hudson river slates or lower Silurian limestones that the mineral springs of Ballston, Saratoga, and Sharon are found. In Delaware, Greene, Sullivan, and parts of Ulster and Broome counties the red and gray sandstones of the Catskill group overlay the Portage and Chemung series of sandstones, slates, and shales; and upon some of the Catskills, and at a few points in Delaware and Sullivan counties, the millstone grit or conglomerate, which forms the floor of the coal formation, caps the highest summits. Only about 100 ft. more of height was needed to reach one or more of the lower coal-beds, and this is as near the carboniferous formation as is reached in New York, though in Pennsylvania coal-beds are formed within 6 m. of the state line. The Portage, underlying the shales of the Chemung, is composed of thin-bedded gray and bluish close-grained sandstones. These are quarried in Ulster, Greene, Albany, and Seneca counties, and to the amount of several million ft. annually are sent to New York for flagging. This formation also yields grindstones. In the w. part of the state the sandstones are bituminous; and at a number of places in Alleghany, Cattaraugus, and Chautauqua counties, springs of petroleum issue from the rocks of this group, sometimes accompanied by jets of carbureted hydrogen gas. The rock formations from the Potsdam sandstone up, with their various subdivisions, constitute what is known as the New York system, and with the carboniferous group complete the Appalachian system. In this state the formations below the carboniferous are very fully developed, and are particularly rich in fossils. At Trenton falls, the ravine is cut through the Trenton limestone formation of the transition period, which contains trilobites, nautili, and other fossils of interest.

The population of the state by the census of 1880 was 5,083,810. The following table shows the changes and the classification of the population since 1790:

TABLE OF POPULATION OF THE STATE OF NEW YORK, 1790 TO 1880.

Census year.	Total population.	Male.	Female.	White.	Free colored.	Slave.	Native.
1790…….	340,120	175,597	164,623	314,142	4,654	21,324	…………
1800…….	589,051	312,667	274,692	557,731	10,417	20,903	…………
1810…….	959,049	493,821	465,228	918,699	25,333	15,017	…………
1820…….	1,372,812	698,215	674,597	1,332,744	29,279	10,088	…………
1830…….	1,918,608	975,796	942,812	1,873,663	44,870	75	…………
1840…….	2,428,921	1,231,268	1,197,753	2,378,890	50,027	4	…………
1850…….	3,097,394	1,567,941	1,529,453	3,048,325	49,069	…………	2,436,771
1855…….	3,466,212	1,729,650	1,736,562	3,417,175	49,037	…………	2,528,444
1860…….	3,880,735	1,933.532	1,947,203	3,831,590	*49,005	…………	2,879,455
1865…….	3,831,777	1,878,641	1,949,177	3,783,110	44,708	…………	2,880,852
1870…….	4,382,759	2,163,229	2,219,530	4,330,210	52,081	…………	3,244,406
1875…….	4,705,208	…………	…………	…………	…………	…………	…………
1880…….	…………	…………	…………	…………	…………	…………	…………

Census year.	Foreign.	Density.	Ratio of increase.	Illiteracy.	Of school age, 5 to 20.	Of military age, 18 to 45.	Of voting age, 21 and upwards.	Citizens.
1790…….	…………	7.24	…………	…………	…………	…………	…………	…………
1800…….	…………	12.53	72.51	…………	…………	…………	…………	…………
1810…….	…………	20.41	63.45	…………	…………	…………	…………	…………
1820…….	…………	29.21	43.14	…………	…………	…………	…………	…………
1830…….	…………	40.83	39.76	…………	…………	…………	…………	…………
1840…….	…………	51.68	26.60	…………	…………	…………	…………	…………
1850…….	655,229	65.90	27.52	78,619	1,053,585	621,904	809,643	598,721
1855…….	939,768	73.75	11.90	96,489	1,127,868	739,812	895,064	652,322
1860…….	1,001,280	82.57	25.29	72,054	1,255,673	741,856	1,006,326	846,273
1865…….	948,157	81.53	1.26	95,865	1,256,914	712,805	975,884	823,464
1870…….	1,138,353	98.25	12.93	239,271	1,230,988	881,500	1,158,901	981,587
1875…….	…………	100.11	7.36	…………	1,579,504	…………	…………	1,138,330
1880…….	…………	…………	…………	…………	…………	…………	…………	…………

* 140 Indians.

The following tables present, respectively, the valuation of the state, real and personal, by counties, as given in the U. S. census of 1880; the debt and taxation by counties; the commerce of the state by customs districts; and the statistics of the different religious denominations:

TABLE FROM THE U. S. CENSUS OF 1880 OF THE ASSESSED VALUATION OF REAL ESTATE AND PERSONAL PROPERTY IN THE COUNTIES IN THE STATE OF NEW YORK.

COUNTIES.	Assessed valuation of Real Estate.	Assessed valuation of Personal Property.	COUNTIES.	Assessed valuation of Real Estate.	Assessed valuation of Personal Property.
Albany……….	$64,295,172	$4,977,970	Onondaga…….	40,137,456	8,605,304
Alleghany……….	10,117,160	1,286,574	Ontario……….	19,129,131	3,956,599
Broome……….	11,978,646	1,174,360	Orange……….	29,800,982	7,085,085
Cattaraugus…….	11,675,021	1,660,334	Orleans……….	11,520,821	1,744,728
Cayuga……….	21,129,631	3,711,775	Oswego……….	18,900,554	1,766,423
Chautauqua…….	18,192,332	3,153,141	Otsego……….	15,710,329	1,566,869
Chemung……….	12,312,463	723,100	Putnam……….	5,356,370	1,510,129
Chenango……….	12,330,132	3,015,075	Queens……….	35,935,460	2,702,100
Clinton……….	7,263,130	1,254,186	Rensselaer…….	37,398,528	4,514,639
Columbia……….	22,748,200	5,276,905	Richmond…….	10,766,906	482,050
Cortland……….	7,786,560	1,168,724	Rockland……….	9,869,131	1,360,903
Delaware……….	9,715,784	1,674,634	Saratoga……….	16,432,874	2,624,180
Dutchess…….	36,045,423	6,217,232	Schenectady…	8,147,581	590,047
Erie……….	72,102,071	9,949,908	Schoharie……….	7,395,379	872,876
Essex……….	8,017,305	900,826	Schuyler……….	5,067,586	736,513
Franklin……….	5,594,655	1,149,216	Seneca……….	10,546,313	1,782,057
Fulton……….	5,051,554	272,993	Steuben……….	15,672,665	2,267,910
Genesee……….	15,041,300	2,596,226	St. Lawrence….	18,554,607	2,254,275
Greene……….	8,666,246	541,056	Suffolk……….	12,851,526	1,861,560
Hamilton……….	798,709	1,800	Sullivan……….	4,287,482	948,490
Herkimer……….	13,455,698	1,507,179	Tioga……….	8,692,061	396,710
Jefferson……….	17,754,311	4,315,476	Tompkins……….	10,244,474	1,612,328
Kings……….	240,875,273	15,742,996	Ulster……….	15,280,273	3,191,606
Lewis……….	6,896,396	824,740	Warren……….	4,268,685	470,478
Livingston……….	15,630,007	2,412,031	Washington…….	16,770,607	3,329,979
Madison……….	12,295,942	2,781,720	Wayne……….	19,215,460	1,812,978
Monroe……….	52,336,450	3,533,804	Westchester…….	56,785,723	3,985,082
Montgomery….	14,310,186	388,299	Wyoming……….	9,874,968	1,269,895
New York….	1,049,340,336	197,532,075	Yates……….	10,070,185	810,100
Niagara……….	18,253,086	1,887,414			
Oneida……….	39,476,087	5,611,494		$2,336,669,813	$352,469,390

TABLE FROM THE U. S. CENSUS OF 1880, GIVING THE DEBT AND TAXATION OF THE STATE OF NEW YORK, BY COUNTIES.

COUNTIES.	Total assessed Valuation.	Total Debt not including School District Debts.	Total Taxation not national, for general purposes, exclusive of School Taxes.
Albany	$69,273,142	$5,052,500	$1,190,684
Alleghany	11,408,734	193,700	110,661
Broome	18,158,006	432,845	218,244
Cattaraugus	13,335,855	82,300	128,347
Cayuga	24,841,406	1,012,990	356,617
Chautauqua	21,345,973	670,200	287,063
Chemung	13,035,562	464,650	245,861
Chenango	15,845,207	1,818,479	292,649
Clinton	8,517,316	335,530	142,780
Columbia	28,020,105	662,276	283,318
Cortland	8,955,304	553,125	118,303
Delaware	11,390,418	1,070,906	201,598
Dutchess	42,262,654	2,345,947	493,054
Erie	82,052,069	9,404,276	1,557,297
Essex	8,918,131	92,700	107,182
Franklin	6,743,871	33,800	96,308
Fulton	5,324,547	342,010	103,650
Genesee	17,637,526	149,818	121,742
Greene	9,207,302	474,941	128,867
Hamilton	800,009	8,005	24,825
Herkimer	14,962,877	57,802	140,261
Jefferson	22,069,787	1,199,208	334,892
Kings	256,618,269	46,510,775	5,141,015
Lewis	7,721,136	157,180	97,614
Livingston	18,042,038	397,485	177,808
Madison	15,077,662	944,330	185,078
Monroe	55,870,254	6,421,884	1,150,548
Montgomery	15,198,485	45,700	160,974
New York	1,246,872,411	142,446,700	28,804,882
Niagara	20,140,500	625,600	266,630
Oneida	45,087,531	1,328,444	568,494
Onondaga	48,642,760	2,070,501	777,496
Ontario	23,085,711	263,759	194,556
Orange	36,836,017	1,444,437	461,222
Orleans	13,265,549	184,458	131,788
Oswego	20,666,976	2,257,628	654,924
Otsego	17,277,138	820,600	181,391
Putnam	6,866,499	8,500	40,866
Queens	38,637,560	2,682,700	707,228
Rensselaer	41,913,157	1,989,635	863,888
Richmond	11,248,956	936,300	324,142
Rockland	11,250,034	17,500	81,094
Saratoga	19,057,054	626,260	268,877
Schenectady	8,737,628	249,688	117,895
Schoharie	8,268,255	278,888	94,638
Schuyler	5,806,099	1,000	54,918
Seneca	12,328,370	310,600	98,865
Steuben	17,910,635	261,890	235,545
St. Lawrence	20,808,882	387,231	264,136
Suffolk	14,713,088	181,350	114,619
Sullivan	4,535,902	595,941	103,844
Tioga	9,088,771	418,600	140,896
Tompkins	11,857,336	707,468	187,764
Ulster	18,471,879	2,872,879	561,114
Warren	4,739,163	151,895	75,897
Washington	20,110,586	35,006	134,148
Wayne	21,028,538	621,458	184,734
Westchester	60,720,755	3,045,871	1,003,028
Wyoming	10,656,963	418,050	96,687
Yates	10,880,285	85,436	89,802
	$2,679,139,133	$248,776,118	$45,962,207

COMMERCE BY CUSTOMS DISTRICTS IN THE STATE OF NEW YORK, 1874, 1875, AND 1880.

CUSTOMS DISTRICTS AND PORTS.	Imports for year ending June 30, 1874.	Domestic exports for year ending June 30, 1874.	Foreign exports for year ending June 30, 1874.	Imports for year ending Jan. 1, 1875.
Buffalo Creek	$2,916,406	$460,478	$53,949	$2,791,211
Cape Vincent	594,489	113,110	....	504,230
Champlain	2,176,784	1,041,154	34,957	2,088,015
Dunkirk	8,628	....	....	4,930
Genesee	429,472	367,527	38	393,074
New York	395,138,622	340,360,269	14,633,460	390,938,533
Niagara	4,579,846	351,078	65,371	3,240,297
Oswegatchie	1,977,751	605,233	136,264	1,923,601
Oswego	7,200,952	1,794,651	187	6,686,785
Total	$414,947,941	$345,023,495	$14,924,229	$408,565,676

COMMERCE BY CUSTOMS DISTRICTS—Continued.

Customs Districts and Ports.	Domestic exports for year ending Jan. 1, 1875.	Foreign exports for year ending Jan. 1, 1875.	Imports for year ending June 30, 1880.	Domestic exports for year ending June 30, 1880.	Foreign exports for year ending June 30, 1880.
Buffalo Creek	$583,288	$7,306	$3,742,681	$325,027	$4,958
Cape Vincent	288,786	....	321,583	96,371	1,655
Champlain	1,144,628	....	2,385,956	1,389,788	....
Dunkirk	....	....	1,713	20	....
Genesee	798,301	38	254,971	127,236	121
New York	332,447,002	13,361,294	459,937,153	385,506,602	7,058,488
Niagara	412,026	68,018	2,971,448	43,832	121,969
Oswegatchie	638,951	183,000	1,287,857	425,159	16,873
Oswego	1,684,266	43,629	5,403,710	897,241	100,631
Total	$337,992,248	$13,663,280	$476,307,022	$388,760,776	$7,299,217

TABLE OF CHURCH STATISTICS OF THE STATE OF NEW YORK, 1870 AND 1875.

Denominations.	Church Organizations. 1870.	Church Edifices. 1870.	Sittings. 1870.	Church Property. 1870.	Church Organizations. 1875.
All denominations	5,627	5,474	2,282,876	$66,073,755	6,357
Baptists	817	795	309,811	7,439,350	898
Free-will and Seventh-day Baptists	85	84	23,875	162,925	99
Christians	95	95	28,175	224,850	107
Congregationalists	268	256	111,785	2,732,500	259
Protestant Episcopalians	475	465	204,290	7,211,150	596
Evangelical Association	25	25	7,300	228,850	31
Friends	89	87	24,910	596,300	95
Jews	47	33	21,400	1,831,950	51
Lutherans	190	182	70,133	1,500,500	257
Methodist Episcopalians	1,745	1,702	606,098	11,768,290	1,675
Methodists, Meth. Protest., Free Meth.	....	....	....	....	278
Miscellaneous	4	2	1,000	30,600	4
Moravians	6	6	3,000	134,600	7
New Jerusalem Church (Swedenborg)	4	3	1,930	175,000	6
Presbyterian Church	672	656	325,780	12,786,900	738
Pres., United, Associate, Reformed	54	49	24,090	644,140	
Reformed Church (late Dutch)	304	300	147,038	7,074,250	277
Reformed Church (late German)	9	8	3,450	134,000	12
Roman Catholics	455	453	271,285	8,558,150	704
Second Adventists	17	11	3,120	45,650	19
Shakers	3	3	2,300	23,000	3
Spiritualists	3	2	580	31,000	3
Unitarians	22	19	8,850	715,300	24
United Brethren in Christ	7	6	1,850	10,200	30
Universalists	124	120	41,610	1,155,950	89
Local Missions	14	14	7,000	580,900	....
Union Churches	93	98	32,801	216,050	95

Denominations.	Church Edifices. 1875.	Clergymen. 1875.	Church Members. 1875.	Adherent Population. 1875.	Church Property. 1875.
All denominations	6,057	6,115	555,049	3,934,690	$79,924,896
Baptists	849	776	114,863	570,400	8,772,450
Free-will and Seventh-day Baptists	97	86	8,146	40,000	278,300
Christians	100	89	9,378	45,000	295,250
Congregationalists	259	219	29,964	149,400	3,127,500
Protestant Episcopalians	585	719	72,768	360,000	8,318,000
Evangelical Association	30	24	3,215	15,000	292,000
Friends	93	....	3,788	17,000	718,500
Jews	40	46	7,642	85,000	2,167,300
Lutherans	241	129	21,185	84,000	2,271,500
Methodist Episcopalians	1,648	1,426	164,858	831,500	17,432,996
Methodists, Meth. Protest., Free Meth.	246	267	31,750	159,900	1,157,600
Miscellaneous	3	4	350	1,300	33,000
Moravians	7	8	750	3,800	160,000
New Jerusalem Church (Swedenborg)	5	6	600	3,000	257,000
Presbyterian Church	729	987	118,881	566,440	14,580,000
Pres., United, Associate, Reformed					7,350,000
Reformed Church (late Dutch)	278	299	42,545	210,250	189,000
Reformed Church (late German)	10	8	1,000	5,000	59,000
Roman Catholics	609	791	....	790,000	10,871,500
Second Adventists	13	12	1,733	6,800	28,000
Shakers	3	....	950	1,400	30,000
Spiritualists	2	....	500	2,500	810,000
Unitarians	21	23	2,100	10,000	37,000
United Brethren in Christ	12	26	3,010	12,000	....
Universalists	81	100	4,390	15,000	1,200,000
Local Missions	....	....	....	....	....
Union Churches	98	80	5,700	20,000	225,000

Railroads.—The number of miles of railroads in the state of New York, Jan. 1, 1880, was 6,008.25. Following is a table comprising a list of all the railroads in the state, with their mileage, cost, earnings, and dividends:

Name of Company.	**Railroads.**		Cost of R.R. per mile.	Length of R.R. worked.	**Revenue per Mile.**			Dividends Paid.
	Total.	N. Y.			Earnings.	Expenses.	Profits.	
	M.	M.	$	M.	$	P. c.	$	P. c.
Adirondack	60.00	60.00	51,225	60.00	1.810	78.78	278	.....
Albany & Susquehanna	142.51	142.51	69,559	177.29	6,871	54.17	3,149	7.
Atlantic & Great Western	422.88	49.24	210,224	512.06	8,777	78.78	1,597	.....
Avon, Gen. & Mt. Morris	17.56	17.56	15,696	.....	507	.....	507	6.
Bath & Hammondsport	9.04	9.04	14,056	9.04	1,279	56.92	550	.....
Black River & Morristown	36.60	36.60	18,501	.....	957	.....	957	.....
Black River & St. Lawrence	12.00	12.00	12,035	.....	.....	.....	.....	.....
Boston & Albany	249.63	56.53	115,536	323.91	18,879	61.36	7,305	8.
Boston, Hoosac Tunnel & Western	40.00	40.00	38,095	40.00	334	.....	.....	.....
Brooklyn, Bath & Coney Island	7.00	7.00	143,325	7.00	7,508	70.10	2,242	.....
Brooklyn, Flatbush & Coney Island	8.00	8.00	156,384	8.00	27,074	49.32	13,724	.....
Brooklyn & Jamaica (L. I.)	9.68	9.68	50,000	.....	.....	.....	.....	.....
Brooklyn & Rockaway Beach	3.50	3.50	69,000	3.50	5,857	99.64	291	.....
Buffalo, Bradford & Pittsburg	25.97	7.80	110,346	.....	923	.....	923	7.
Buffalo, Chautauqua Lake & Pittsb'g	44.00	37.80	45,454	44.00	2,664	77.73	593	.....
Buffalo Creek	4.00	4.00	79,928	4.00	14,469	41.05	8,529	.....
Buffalo Erie Basin	0.26	0.26	54,012	.....	.....	.....	.....	.....
Buffalo & Southwestern	67.47	67.47	42,969	67.47	5,215	96.87	163	.....
Buffalo, N. Y. & Erie	139.95	139.95	23,786	.....	2,000	.....	2,000	7.
Buffalo, N. Y. & Philadelphia	120.55	78.65	54,378	120.55	7,919	60.16	3,155	.....
Carthage, Watertown & S. H	30.00	30.00	26,226	.....	700	.....	700	.....
Cayuga & Susquehanna	34.61	34.61	21,500	34.61	1,780	88.17	211	9.
Cazenovia, Canastota & De R	28.59	28.59	20,922	28.59	1,908	99.13	17	.....
Chateaugay	34.63	34.63	7,246	51.91	.....	.....	.....	.....
Chemung (N. C)	17.40	17.40	21,840	.....	1,686	.....	1,686	6.
Cherry Valley, Sharon & Albany	20.91	20.91	28,694	.....	1,004	.....	1,004	.....
Clayton & Theresa	15.86	15.86	20,285	.....	888	.....	888	.....
Clove Branch	4.25	4.25	38,060	4.25	4,539	81.19	955	.....
Cooperstown & Susquehanna Valley	16.00	16.00	30,749	16.00	2,059	61.47	814	.....
Corning, C. & Antrim	64.00	15.64	37,256	.....	2,797	.....	2,797	6.
Dannemora	17.28	17.28	.....	.....	.....	.....	.....	.....
Dunkirk, Alleghany Valley & P	90.60	42.30	53,106	90.60	3,125	.....	Def.	.....
Elmira, Jefferson & Canandaigua	46.60	46.60	10,730	.....	1,084	.....	1,084	5.
Elmira State Line	6.52	6.52	29,176	.....	.....	.....	.....	.....
Elmira & Williamsport (N. C.)	76.70	6.80	35,450	.....	2,541	.....	2,541	6.
Erie International	4.26	4.26	.....	.....	.....	.....	.....	.....
Erie & Genesee Valley	12.29	12.29	15,566	.....	688	.....	688	.....
Flushing, North Shore & Central	38.82	38.82	88,247	.....	1,611	.....	1,611	.....
Fonda, Johnstown & Gloversville	10.00	10.00	53,251	26.17	3,975	55.97	1,750	.....
Garnerville	0.91	0.91	41,054	0.91	.....	.....	.....	.....
Geneva & Lyons	14.12	14.12	33,000	.....	.....	.....	.....	.....
Geneva, Ithaca & Sayre	113.63	113.63	32,626	113.63	2,663	.....	Def.	.....
Glens Falls	5.74	5.74	18,578	.....	.....	.....	.....	.....
Gloversville & Northville	16.17	16.17	16,789	.....	853	.....	853	.....
Goshen & Deckertown	11.65	11.65	24,107	.....	1,849	.....	1,849	4.
Greene	8.10	8.10	50,011	8.10	5,521	52.01	2,575	6
Greenwich & Johnsonville	14.00	14.00	21.864	16.00	.....	.....	.....	.....
Harlem River & Portchester	11.80	11.80	213,699	.....	11,017	.....	11,017	.....
Ithaca, Auburn & Western	27.00	27.00	55,000	.....	.....	.....	.....	.....
Jersey City & Albany	34.00	11.00	30,829	.....	.....	.....	.....	.....
Junction, Buffalo	7.67	7.67	27,909	.....	.....	.....	.....	.....
Kings Co. Central	3.25	3.25	33,446	.....	.....	.....	.....	.....
Lackawanna & Susquehanna	22.01	17.45	58,367	.....	.....	.....	.....	.....
Lake Champlain and Moriah	7.66	7.66	60,300	7.66	11,453	96.98	3,467	10.
Lake Ontario Southern	33.60	33.60	61.890	33.60	1,163	90.01	116	.....
Lake Shore & Michigan Southern	864.60	71.00	92,502	1,176.80	12,900	58.62	5,336	6.5
Lebanon Springs	57.00	51.00	70,176	57.00	1,022	97.52	26	.....
Lockport & Buffalo	13.00	13.00	33,333	.....	.....	.....	.....	.....
Long Island	158.29	158.29	40,052	325.62	4,969	79.08	1,039	.....
Marine	5.00	5.00	11,314	5.00	7,244	30.84	5,009	25.
Metropolitan Elevated	10.50	10.50	181,233	10.50	125,060	56.77	37,870	10.
Middleburg & Schoharie	5.75	5.75	18,260	5.75	993	80.26	197	.....
Middletown & Crawford	10.22	10.22	19,071	10.22	2,106	70.84	614	.....
Middletown, Unionville & Water Gap	13.00	13.00	26,960	.....	3,077	.....	3,077	7.
Montgomery & Erie	10.26	10.26	27,108	.....	2,426	.....	2,426	7.
Nanuet & New City	4.50	4.50	16.963	.....	.....	.....	.....	.....
Newburg, Dutchess & Cornwall	58.58	58.58	35,026	58.58	2,808	88.72	317	.....
Newburg & New York	12.59	12.59	21,213	.....	1,400	.....	1.400	.....
New Jersey & New York	31.50	18.50	71,270	36.50	4,336	73.89	1,132	.....
Newtown & Flushing	3.97	3.97	65,000	.....	.....	.....	.....	.....
New York, Bay Ridge & Jamaica	8.16	8.16	68.031	.....	4,288	.....	4,288	7.
New York & Canada	149.93	149.93	54,358	149.93	2,841	69.85	857	.....
New York Central & Hudson River	740.17	740.17	135,621	1,018.27	25,286	59.26	10,289	8.
New York Central Niagara R	2.81	2.81	10,000	.....	.....	.....	.....	.....
New York City & Northern	51.33	51.33	58,473	51.33	.....	.....	.....	.....
New York Elevated	17.50	17.50	573,278	17.50	127,979	52.34	61,044	10.
New York & Flushing	2.73	2.73	.....	.....	.....	.....	.....	.....
New York & Harlem	126.96	126.96	166,782	.....	11,511	.....	11,511	8.
New York, Lake Erie & Western	525.69	484.21	223,833	936.30	17,149	70.09	5,107	.....
New York & Mahopac	7.09	7.09	37,440	.....	.....	.....	.....	.....

Name of Company.	Railroads.		Cost of R.R. per mile.	Length of R.R. worked.	Revenue per Mile.			Dividends Paid.
	Total.	N. Y.			Earnings.	Expenses.	Profits.	
	M.	M.	$	M.	$	P. c.	$	P. c.
New York & Manhattan Beach	14.79	14.79	58,450	22.85	12,974	62.21	4,904	16.
New York, New Haven & Hartford	140.50	15.13	111,979	152.30	26,250	52 16	12,539	10.
New York, Ontario & Western	344.00	344.00	76,243	344.00	1,537	93.17	104	....
New York & Rockaway	8.91	8.91	38,750	....	....	....	....	.....
New York & Sea Beach	6.00	6.00	....	....	....	....	....	.....
Niagara, B. & Canandaigua	98.46	98.46	10,156	....	610	....	610	6.
Northern of New Jersey	21.25	1.44	25,059	....	1,318	....	1,318	.....
Nyack & Northern	4.33	4.33	54,560	....	2,546	....	2,546	.....
Ogdensburg & Lake Champlain	122.00	122.00	48,110	118.00	3,870	77.80	855	.....
Ogdensburg & Morristown	10.62	10.62	11,125	....	....	....	....	.....
Olean, Bradford & Warren	23.00	12.53	11,290	12.53	6,078	51.41	2,951	31.
Oswego & Rome	28.58	28.58	31,914	....	1,636	....	1,636	.....
Oswego & Syracuse	34.98	34.98	50,358	34.98	11,115	58.88	4,570	9.
Port Jervis & Monticello	23.75	23.75	47,329	23.75	1,087	93.73	68	.....
Poughkeepsie, Hartford & Boston	42.66	42 66	35,160	42.66	1,092	85.58	179	.....
Rensselaer & Saratoga	182.62	182.62	54,148	182.62	8,140	54.42	3,076	8.
Rhinebeck & Connecticut	35.20	35.20	41,101	35.20	1,969	85.38	288	.....
Rochester & Genesee Valley	18.26	18.26	36,770	....	1,860	....	1,860	6.
Rochester & Lake Ontario	6.00	6.00	....	....	....	....	....	.....
Rochester & State Line	107.56	107.56	43,579	107.56	1,908	64.89	766	.....
Rome & Clinton	12.70	12.70	28,348	12.70	2,063	79.85	414	4.
Rome, Watertown & Ogdensburg	380.80	380.80	24,588	408.88	2,796	72.12	755	.....
Schenectady & Duanesburg	14.50	14.50	41,414	....	2,554	....	2,354	.....
Schoharie Valley	4.88	4.88	23,542	4.88	3,196	47.86	1,530	4.
Silver Lake	6.50	6.50	20,250	6.50	1,667	75.17	414	.....
Skaneateles	5.50	5.50	32,911	5.50	3,068	85.46	446	.....
Smithtown & Port Jefferson (L. I.)	19.02	19.02	29,822	....	....	....	....	.....
Southern Central	114.00	114.00	32,116	114.00	3,684	75.64	897	.....
Southern of Long Island	67.87	67.87	48,668	....	763	....	763	.....
Southfield Branch	1.50	1.50	10,817	1.50	....	....	....	.....
Springville & Sardinia	11.57	11.57	15,343	11.57	714	69.60	218	.....
Spuyten Duyvil & Port Morris	6.04	6.04	163,423	....	....	....	....	.....
Staten Island	13.00	13.00	37,000	13.00	5,179	....	....	.....
Sterling Mountain	7.60	7.60	64,852	7.60	....	....	....	.....
Stewart (L. I.)	16.34	16.34	....	....	....	....	....	.....
Suspension Bridge & Erie Junction	23.28	23.28	50,045	....	3,007	....	3,007	.....
Syracuse, Binghamton & New York	81.00	81.00	49,862	81.00	10,245	60.59	4,040	4.5
Syracuse, Chenango & New York	43.49	43.49	24,475	43.49	1,662	94.80	86	.....
Syracuse, Geneva & Corning	57.25	57.25	89,385	....	1,729	....	1,729	.....
Syracuse Junction	7.81	7.81	91,218	....	....	....	....	.....
Troy & Bennington	5.38	5.38	44,044	....	2,844	....	2,844	8.
Troy & Boston	34.74	34.74	82,143	52.89	12,905	51.42	6,209	.....
Troy & Greenbush	6.00	6.00	49,168	....	3,441	....	3,441	7.
Troy Union & Depot	2.14	2.14	366,350	2.14	....	100.00	....	.....
Ulster & Delaware	74.00	74.00	18,143	74.00	2,409	89.53	252	.....
Utica & Black River	87.00	87.00	132,283	170.00	2,531	61.31	917	4.
Utica, Chenango & Susquehanna Val	97.41	97.41	42,397	97.41	5,356	54.05	2,462	6.
Utica, Clinton & Binghamton	31.30	31.30	41,518	31.30	1,921	79.86	398	4.
Utica, Ithaca & Elmira	71.00	71.00	40,226	71,00	2,211	100.00	....	.....
Valley	11.50	11.50	73,310	11.50	24,658	36.88	15,588	8.
Wallkill Valley	33.00	33 00	27,492	33.00	2,541	83.03	431	.....
Warwick Valley	10.16	10.16	19,670	10.16	3,643	56.66	1,579	3.5
Waverly & State Line	1.00	1.00	64,398	....	....	....	....	.....

TABLE OF EDUCATIONAL STATISTICS.

A summary of statistical reports for year ending Sept. 30, 1877.

	Cities.	Towns.	State.
Number of districts	....	11,287	11,287
Number of teachers employed at the same time for 28 weeks or more	5,890	13,848	19,738
Number of children between 5 and 21 years of age	744,911	841,323	1,586,234
Number of male teachers employed	684	7,316	7,830
Number of female teachers employed	6,044	16,267	22,311
Number of children attending the common schools	407,348	616,872	1,024,715
Average daily attendance	244,236	315,301	559,537
Number of visitations by school commissioners	....	19,226	19,226
Number of volumes in district libraries	147,051	618,495	765,546
Number of log school-houses	....	87	87
Number of frame school-houses	60	9,971	10,031
Number of brick school-houses	368	912	1,280
Number of stone school-houses	10	495	495
Whole number of school-houses	438	11,395	11,833

In 1878 the report was as follows: Number of school districts, 11,270; school-houses, 11,824; teachers, 30,567; children of school age, 1,615,256; average daily attendance, 577,606: expenditures, $11,793,627.67; value of school property, $30,147,580. In 1879 the figures returned were as follows: School age, 5 to 21; school population, 1,586,234; number of pupils enrolled, 1,023,715; average attendance, 577,606; average school days in year, 179; number of teachers, 30,567; school fund, $7,094,629; income, $12,110,903; expenditures, $10,976,234; value of school property, $30,886,248.

TOTAL EXPENDITURES FOR MAINTENANCE OF OUR PUBLIC SCHOOLS IN EACH YEAR, FROM 1850 TO 1879, INCLUSIVE.

1850	$1,607,684.85	1866	$6,682,985.94
1851	1,884,826.16	1867	7,688,201.22
1852	2,249,814.02	1868	9,040,942.02
1853	2,469,248.52	1869	9,886,786.29
1854	2,666,609.36	1870	9,905,514.22
1855	3,544,587.62	1871	9,607,903.81
1856	3,323,049.98	1872	10,416,588.00
1857	3,792,948.79	1873	10,946,007.21
1858	*2,500,000.00	1874	11,088,981.70
1859	3,664,617.57	1875	11,459,358.48
1860	3,744,246.95	1876	11,489,038.78
1861	3,841,270.81	1877	10,976,234.45
1862	3,955,664.33	1878	11,793,627.67
1863	3,859,159.21	1879	10,976,234.00
1864	4,549,870.66		
1865	5,785,460.24	Total	$105,242,407.81

NEW YORK, the most important city and sea-port of the United States, and the third in the civilized world, is situated on the east side of the mouth of the Hudson river, at its confluence with a narrow strait called East river, which opens into Long Island sound, in the state of New York, 18 m. from the ocean. Lat. 40° 42′ 43″ n., long. 74 0′ 8″ west. The city comprises the island of Manhattan, formed by the Hudson river and the East river, and separated from the main-land by a narrow strait called Harlem river, on the e., and on the w. by Spuyten Duyvel creek; includes several smaller islands, containing the fortifications in the harbor, and the public institutions in the East river; and also part of the main-land n. of Manhattan island. The island on which the city is built is 13¼ m. long, and with an average breadth of 1⅗ of a mile, comprising 22 sq. miles. A rocky ridge runs through the center, rising at Washington heights, 238 feet. The compactly built city extends five m. from the "battery" at its southern point, and is laid out regularly into 141,486 lots. Avenues 100 feet wide and 8 miles long, in straight lines, are crossed at right angles by streets from 60 to 100 feet wide, extending from river to river. The city is connected with the main-land of New York by bridges across the Harlem river, with Long island by a fine suspension bridge, and with New Jersey, Long island, and Staten island by numerous steam-ferries. Several railways radiate from the city, while the finest passenger steamboats in the world pass up the Hudson, Long Island sound, and down the Narrows, through the lower bay. The harbor, formed by the upper and smaller bay, with its two arms, which almost inclose the city, is one of the finest in the world. There are 80 piers for shipping on the west, and 70 on the east side of the city. The harbor is defended by fourteen forts, mounting 1500 guns. The streets are traversed by many city omnibuses and tramways, which carry millions of passengers annually.

The city is built of brick, brown sandstone, and white marble. Among its finest edifices are the city hall, custom-house, Trinity church, Grace church, two universities, cathedral, academy of music, Cooper institute, and the numerous great hotels, several of which have accommodation for more than a thousand persons. Of 381 churches, 72 are Protestant Episcopal, 41 Roman Catholic, and the others of all denominations. In 1878 there were 228 public schools and 17 corporate schools with 286,548 pupils, and the college of the city of New York, formerly the free academy. Besides, there are 35 Roman Catholic schools, and colleges and academies of the religious orders. Columbia college is one of the oldest in the country; the university of the city of New York has been more recently established. Each has departments of law and medicine, and there are two other medical colleges, several theological seminaries, and many private academies. The hospitals and institutions of charity are on a liberal scale; and besides legal outdoor relief, the poor are visited and cared for by a public society, with agents in every district. Among the charities are asylums for insane, blind, deaf and dumb, magdalens, foundlings, etc. The Astor free library, founded by John Jacob Astor, has 150,000 carefully selected volumes; the mercantile library, 150,000 volumes, with a large reading-room; society library, 64,000; apprentices' library, 50,000, with rich museums of antiquities; the Cooper institute, a present to the city by Peter Cooper, has a free reading-room, picture-gallery, art-schools, etc. Annual art exhibitions are given by the national academy of design, Dusseldorf, and international galleries. The academy of music, or opera-house, has seats for 4,700 persons, and eight or ten theaters give nightly entertainment to 20,000. The Central park, laid out in the finest style of landscape-gardening, is two and a half miles long by three-fifths of a mile wide. Eighteen smaller public parks are scattered over the city. The Croton aqueduct brings a river of pure soft water from 40 miles distance, which is received in reservoirs of a capacity of 1,500,000,000 gallons, and distributed through 370 miles of pipes, with such a head as to supply public fountains of 60 and 80 feet jet, and the upper stories of most buildings. Eleven markets supply annually 140,000,000 lbs. beef, 25,000,000 lbs. mutton, 56,000,000 lbs. pork, and immense quantities of poultry, game, fish, oysters, fruits, and vegetables. The city government is composed of a mayor, boards of aldermen and councilmen, and bureaux of various departments. The police numbers about 2,500, with salaries of $800 to $5,500 a year. The stations are connected by telegraph. and have lodgings for destitute persons. A sanitary squad has charge of the public health. The commissioners of charity and correction have direction of asylums, hospitals, and prisons. Commissioners of emigration receive and attend to the wants of immigrants. The volunteer brigade of firemen has been replaced by a paid fire department, which is found to be much more effective for the protection of property. It consists of upwards of 700 men. with above 40 steam fire-engines, and a large number of telegraph stations. New York is the great center of American finance and commerce. It receives 66 per cent of all imports, and sends out 50 per cent of all exports. The total value of imports in 1873-74 was $395,133,622; of exports, $354,993,782. Vessels entered, 6,723, of 5,049,618 tons; cleared, 6,103, of 4,837,218 tons. The total number of vessels belonging to the port of New York was 6,630, of 1,318,523 tons. There were, in 1870, 7,624 manufacturing establishments, employing 129,577 hands, the cost for wages being $63,884,049, and the value of products $332,951,520. The assessed value of real and personal estate in 1875 was $1,154,029,176. The number of immigrants that arrived in New York during the year ending June 30, 1874, was 260,814.

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* Estimated.

New York, the Nieu Amsterdam of the Dutch, was founded in 1621; in 1664 it was taken by the English. At the period of the revolution it was smaller than Philadelphia or Boston; but increased in importance, especially after the completion of the Erie canal had opened to it the commerce of the west. In 1789, 2,086 persons died of yellow fever: in 1832, 3,513 of cholera; in 1845 a fire destroyed a large portion of the business part of the city, with a loss of $18,000,000. In 1741, in consequence of a supposed negro plot to burn the city, 13 negroes were burned at the stake, 20 hanged, and 78 transported. In 1863, in a riot caused by the conscription, the popular fury again turned against the negroes, and numbers were murdered.

NEW YORK, co. N.Y. (See New York, city.)

NEW YORK (*ante*). The city of New York, which formerly comprised only Manhattan and other islands, was extended by legislative act, taking effect Jan. 1, 1874. to include the following villages of Westchester co., on the main-land: Morrisania, West Farms, Kingsbridge, Mott Haven, North New York, Port Morris, Melrose, Woodstock, Highbridgeville, Claremont, Tremont, Mount Hope, Mount Eden, Fairmount, Belmont, Fordham, Williamsbridge, Spuyten Duyvel, Mosholu, Riverdale, and Mount St. Vincent. Its present boundaries are Yonkers on the n., the Bronx river and the East river on the e., the bay on the s., and on the w. the Hudson or North river. It extends 16 m. n. from the Battery, is 4½ m. wide at its widest part, and has a total area of 41¼ sq.m., or 26,500 acres.—That part of the city comprised by Manhattan island is connected with the main-land by, 1, an iron drawbridge from 3d avenue, called Harlem bridge; 2, the railroad bridge at 4th avenue of the New York Central and Hudson River railroad, and the New York and Harlem and the New York and New Haven railroads; 3, Central, formerly McComb's Dam, bridge; 4, King's bridge, at the point of meeting of Harlem river and Spuyten Duyvel creek; 5, High bridge. The latter is the way by which the Croton aqueduct crosses the Harlem river at 175th street. It is 1460 ft. in length and 116 ft. high at its highest elevation above the surface of the river. The water crosses it in great pipes made of cast-iron, and built into brick masonry. At the lower end of High bridge is an engine-house and a tower for high-water service. New York is connected with Brooklyn and other places on Long Island by numerous ferries, over which it is estimated that 75,000,000 persons cross annually. To relieve the ferry traffic the East river suspension bridge was undertaken by a company formed in 1869 with a capital of $500,000; to which the legislature of the state permitted the city of New York to add $3,000,000, and the city of Brooklyn $1,500,000—in all a capital of $5,000,000; see Bridge. Between New York and Jersey City, on the w. bank of the Hudson, a comprehensive ferry system is sustained, which is to be relieved by the tunnel under the Hudson river, now being constructed; see Tunnel. New York is also connected with Hoboken, N. J., and with various points on Staten Island by lines of ferry-boats.—*Piers.* There are 133 piers or wharves, of which number 63 are on the Hudson and 70 on the East river. From the piers on the North river steamers sail coastwise to the West Indies, to Great Britain and the continent of Europe, and to Boston, Halifax, N. S., Albany and other points on the Hudson river, and New Orleans. From the East river side steamers sail coastwise to English and Scotch ports, to Philadelphia, to points on Long Island, and to Portland, Me., New Bedford, Mass., and points on the sound, Connecticut river, and Narragansett bay. On this side, also, are the balance, sectional, and screw dry docks, and the New York city dumping-grounds. At the piers on both sides, also, is accommodated the enormous sailing commerce of the metropolis.—*Railroads.* Three railroad lines terminate within the city limits: the New York Central and Hudson River, the New York and Harlem, and the New York, New Haven and Hartford, all at the Grand Central depot in 42d street, the latter having also a freight depot on Centre street, and the New

York Central and Hudson River a depot for local trains at 30th street and 10th avenue, and a freight depot at the former site of St. John's park. All other railroad lines terminate in Jersey City and Hoboken, N. J., excepting the New Jersey Southern, which has its depot at Sandy Hook, connecting with the city by steamboat, and the Long Island railroads, which terminate at Hunter's Point, L. I., connecting with the city by ferry.—*Streets.* There are 378 named streets, places, courts, avenues, and boulevards, 168 numbered streets, 13 numbered avenues, and 5 avenues designated respectively A, B, C, D, and E. The numbered cross-streets are designated e. and w. from 5th avenue; each avenue beginning a new hundred numbers.—*Churches.* There are 372 churches, synagogues, chapels, and meeting-houses, of which 9 are colored Methodist Episcopal, 3 Friends' meeting-houses, 26 Jewish synagogues, 21 Lutheran, 50 Methodist Episcopal, 42 Presbyterian, 72 Protestant Episcopal, 19 Reformed Dutch, 55 Roman Catholic, 3 Unitarian, 6 United Presbyterian, 4 Universalist, 31 Baptist, 6 Congregational, 5 Reformed Presbyterian, miscellaneous, 20.—*Libraries.* The public libraries include the Apprentices', Astor, Bar Association, City, Cooper Union, American Institute, Mercantile, Harlem, Historical Society, Law Institute, Lenox, Mott Memorial, New York free circulating, Society, Printers', Woman's, and Young Men's Christian Association; see LIBRARIES.—*Theaters.* The theaters include Aberle's, the Academy of Music, Bijou opera house, Daly's, Fifth Avenue, Germania, Globe, Grand Opera House, Harry Miner's, London, Haverly's 14th street, Haverly's Niblo's Garden, Madison square, Aquarium, Park, San Francisco minstrels, Stadt theater, Standard, Thalia, Theater Comique, Tony Pastor's, Union square, Wallack's, Windsor.—*Clubs.* Army and Navy, Century, Down-Town, Harmonic, Knickerbocker, Lotos, Manhattan, Merchants', New York, Press, Raquette, St. Nicholas, Union, Union League, and University.—*Parks.* Besides the Central park there are the Riverside, Battery, City hall, Gramercy, Morningside, Madison, Stuyvesant, Jackson, Abingdon, Union, Reservoir, Washington, Mount Morris, and Tompkins squares, and Bowling Green. Central park was begun in 1858, that portion of the city being included which lies between 59th and 110th streets and between 5th and 8th avenues, and containing 840 acres, of which about one-half is woodland, the remainder being laid out in lawns, driving and bridle roads, gardens, pasture, play ground, etc.; there are two extensive lakes, with rustic bridges, used for boating in summer and skating in winter, covering 25 acres, and four smaller sheets of water, comprising in all as much more.—*Metropolitan Museum of Art.* This institution was founded in 1870, "for the purpose of establishing a museum and library of art, of encouraging and developing the study of the fine arts, of the application of art to manufactures and to practical life, of advancing the general knowledge of kindred subjects, and, to that end, of furnishing popular instruction and recreation." The number of members of the corporation is limited to 250; the trustees, 21 in number, holding office for 7 years, the terms of office of 3 of the number expiring every year. The museum was at first in a building in 5th avenue, between 53d and 54th streets; afterwards removed to the Douglas mansion in 14th street, where it remained until 1879–80, when it was permanently placed in the building erected for it by the park department in the Central park, at a cost of $500,000. This building was opened Mar. 30, 1880, by the president of the United States. It is situated in Central park, at 5th avenue and 82d street; is built in modern Gothic style, of red brick, with sandstone trimmings; is 218 ft. long and 95 broad, facing to the east. It contains the Blodgett collection of Flemish, Dutch, and other paintings, the unique Cesnola collection of Cypriote archæological objects, the Avery collection of pottery, and numerous other articles of great beauty and interest. The museum is opened free of charge to the public on Wednesdays, Thursdays, Fridays, and Saturdays; on Mondays and Tuesdays the charge for admission is fifty cents.—The area of the other parks is as follows: Bowling Green, 0.517 acre; Battery, 21.199; City hall, 8.234; Washington square, 8.115; Cooper Union, 0.224; Tompkins square, 10.508; Union square, 3.483; Madison square, 6.492; Reservoir square, 4.775; Mount Morris, 20.173; Morningside, 31.258; Stuyvesant square, 4.229; Abingdon square, 0.202.—*Museum of Natural History.* Incorporated by the state legislature in 1869; opened to the public in its present building, Central park, 81st street and 8th avenue, on Dec. 22, 1877. It is built of red brick, with yellow sandstone trimmings, in the modern Gothic style. The collection comprises mounted specimens of mammalia and birds; archæological specimens, including the De Morgan collection of stone implements; the Squier and Davis Mississippi valley collection; geological specimens of New York state; building stones, marbles, woods, wax fruits, etc.; admission free.—The art galleries comprise those of the academy of design (where exhibitions are made); the Metropolitan museum and Lenox library; the American art gallery (Kurtz's) in 23d street; galleries of Knoedler, Avery, Schaus, Cottier, Reichert, and Kohn, dealers in paintings, and the private galleries of leading citizens, which can generally be inspected on proper introduction.—*Banks.* There are in New York 46 national banks, 22 state banks, 25 savings banks.—There are 38 hospitals and 23 dispensaries and infirmaries. The number of benevolent societies and other similar institutions is 125, public and private.

Education.—The New York public school system is under the general control and direction of the board of education, supplemented by trustees and school inspectors. The board is composed of 21 members, appointed by the mayor, who are called commissioners, and who appoint 5 trustees in each ward, the mayor appointing 8 inspectors in each school district; the rooms of the board of education are at 146 Grand street. The whole number of public schools is 305, the attendance being about 275,000 children, taught by 3,275 teachers, at an annual expense of $3,300,000. The classification of all the schools in the city is as follows:

College of the city of New York	1
Normal school and training school	1
Saturday normal school for teachers	1
Grammar schools for males	46
" " " females	46
" " " both sexes	12
Primary departments of grammar schools	67
Primary schools (separate)	46
Colored schools	5
Corporate schools (industrial, reformatories, orphan asylums, etc.)	47
Evening schools, including evening high school	32
Nautical school (ship St. Mary's)	1
Total	305

The evening schools supply instruction to about 20,000 children and others who are obliged to work during the day. The salaries paid to teachers vary between $600 and $3,000 per annum. The college of the city of New York was established in 1847, and until 1866 was known as the New York free academy. The members of the board of education are *ex officio* trustees of the institution. It is open only to pupils from the public schools who have been in attendance at least one year. The faculty comprises a president, 14 professors, and 19 tutors. The students in the introductory classes number about 800, and those in the college classes about 450 each year. The college confers the degrees of B.A., M.A., B.S., and M.S. The buildings are on Lexington avenue and 23d street, massively built of brick, and valued at $150,000; they contain a library, natural history cabinet, and scientific apparatus, the whole valued at $75,000. The annual cost of maintaining the college is about $150,000. The normal college for women is on 69th street, between Lexington and 4th avenues. The building is 300 ft. long and 125 ft. wide, fronting on 4th avenue. It contains 30 recitation rooms, 3 large lecture rooms, a library, calisthenium, retiring rooms for instructors, president's offices, and a main hall to seat 1600 persons; its cost was $350,000. There is also a model or training school for practice. The main building is very striking, built in the secular Gothic style, with high tower. This college is under the control of the board of education, being a part of the public school system; its object is to prepare teachers for the common schools. About 1600 pupils are usually on the roll, the curriculum including Latin, physics and chemistry, German, natural science, French, drawing, and music. The cost of maintaining this institution is about $100,000 per annum. Other institutions of learning in the city are Columbia college, the university of the city of New York, and the medical, law, and theological schools and seminaries. Columbia college, originally King's college, was chartered in 1754, and at first supported from funds raised in England for the purpose. The corporation of Trinity church erected the first college building on the church lands between College place and the Hudson river. It was finally incorporated under its present name in 1784, but the charter was amended three years later, vesting the management of the college in a self-perpetuating body of 24 trustees, under which direction it still remains. About 1850 the old buildings were surrendered, and the college removed to its present site on Madison and 4th avenues, 49th and 50th streets. The college is under the control of a president and about 60 professors; the students reside at their homes. The departments are the academic, the school of mines, and the law school, the latter being in a building corner of Lafayette place and Great Jones street. The university of the city of New York is comprised in the university building on Washington square, and the medical college building on E. 26th street, opposite Bellevue hospital. The university was chartered in 1830, and is non-denominational. The building is a handsome Gothic structure of white freestone. The income is about $40,000 annually. Instruction in the departments of the arts and sciences is given free of charge, the course being 4 years; that of law is 2 years. The average number of students is 500. Examinations are held each year on the Tuesday preceding the commencement in June, and that preceding the opening of the first term in September, in the departments of arts and sciences. No examination is required for the other departments, their year beginning on the first Monday in October. The regular medical schools or colleges are Bellevue hospital medical college, the College of physicians and surgeons, and the University medical college, the second of these being the medical department of Columbia college. Bellevue hospital medical college is situated within the hospital grounds, at the foot of E. 26th street. It was founded in 1861, is independent of the city colleges, and is under the control of the commissioners of public charities and corrections, who are *ex officio* members of the board of trustees. The applicant for admission must be 18 years of age, but there are no other requirements. Graduation takes place after 3 years' study of medicine under a regular physician in good standing, attendance on two full courses of medical lectures (the last being in the college), attendance on one course of instruction in practical anatomy or dissections, proper testimonials of character, a written thesis, and examination in the practice of medicine, surgery, obstetrics, materia medica, physiology, anatomy, and chemistry. The fees in all amount to $185. The number of students is about 500, and the college ranks high in general estimation. The Protestant Episcopal theological seminary is situated in what is known as Chelsea square, between 9th and 10th avenues and 20th and 21st streets. It was founded in 1819 and chartered in 1822. The governing body comprises "all the bishops of the church, *ex officio;* 1 trustee from each diocese, and 1 additional for every 8 clergymen in the same; 1 more additional for every $2,000 of money contributed, until the same amounts to $10,000, and then 1 more additional for every $10,000." The faculty consists of a dean and staff of professors, and the course of study lasts 3 years. The Union theological seminary is on University place, between Waverley and Clinton places. It was founded in 1836, and is governed by a board of trustees, consisting of 28 members of the Presbyterian church, one-half clergymen and one-half laymen. The seminary course occupies 3 years. The library has 35,000 volumes, and as many pamphlets, and is very valuable.

Fire Department.—This department consists of 3 commissioners, appointed by the mayor, and confirmed by the board of aldermen, and holding office for 6 years. The president of the board receives a salary of $7,500, and the others $5,000 each. The machinery of the department includes 42 steam fire-engines, 4 chemical engines, and 18 hook and ladder trucks; there are 12 fuel depots, 7 bell-towers and lookouts and repair-shops, hospital, stables, etc. The department comprises 892 men, of whom about 750 perform active service. About 600 fire-alarm boxes are scattered over the city. The expense of the department is about $1,250,000 annually. The relief and life insurance fund of the department had on hand at the close of 1880 the sum of $450,072.88; the receipts during the year were $54,696.44; the disbursements, $27,192.68. Following is a table of fire statistics for 15 years:

YEAR.	No. of Fires.	Aggregate Loss.	Average Loss.	No. of Companies.	No. of Men.
1866	796	$6,428,000	$8,075.88	54	974
1867	873	5,711,000	6,541.81	54	919
1868	740	4,342,000	5,867.57	52	592
1869	850	2,696,398	3,172.23	53	599
1870	964	2,120,212	2,199.39	52	596
1871	1,258	2,127,356	1,691.06	52	596
1872	1,649	2,891,818	1,753.67	52	596
1873	1,470	4,022,640	2,736.48	54	651
1874	1,355	1,430,306	1,055.58	64	712
1875	1,418	2,472,536	1,743.67	67	748
1876	1,382	3,851,213	2,786.70	68	747
1877	1,450	3,210,695	2,214.27	65	752
1878	1,654	1,884,505	1,139.36	65	727
1879	1,551	5,671,580	3,656.72	64	729
1880	1,783	3,183,440	1,785.44	65	749
Total	19,193	$52,043,694	$2,711.59		

The health department is under the direction of a board of health, which has charge of all sanitary matters pertaining to the city government (excepting street cleaning), and which records the births, marriages, and deaths within the city limits quarterly. During the quarter ending Dec. 31, 1880, the number of persons registered as married was 5,218, and the number of children born was 7,017.

The population of the city by the U. S. census of 1880 was 1,206,577. During the year 1880 the number of deaths was 31,937, an increase of 3,595 on the previous year; the number of deaths, in proportion to population, was 26.47 in every 1000; 26.37 for the white population, and 33.87 for the colored. The annual death-rate per 1000 for previous years was: 1879, 25.82; 1878, 24.93; 1877, 24.50; 1876, 27.62; 1875, 29.47; 1874, 28.94; 1873, 29.68; 1872, 33.96; 1871, 28.26. Following is the table of diseases causing death for 1880, showing the comparative mortality according to sexes:

DISEASES.	Females.	Males.	Total.
Phthisis pulmonalis	2,260	2,446	4,706
Pneumonia	1,270	1,522	2,792
Bronchitis	671	704	1,375
Diarrheal diseases	1,853	2,094	3,947
Bright's disease and nephritis	486	539	1,025
Heart disease	572	581	1,153
Cancer	441	218	659
Intemperance			302
Inanition, mostly children			307
Small-pox	12	19	31
Measles	223	256	479

Diseases.	Females.	Males.	Total.
Scarlatina	295	323	618
Yellow fever	...	1	1
Diphtheria	717	673	1,390
Whooping cough	143	134	277
Typhus fever	1	1	2
Typhoid fever	106	135	241
Croup	429	481	910
Cerebro-spinal fever	71	99	170
Malarial fever	236	234	470
Remittent fever	85	65	150
Intermittent fever	80	83	163
Typho-malarial fever	64	67	131
Erysipelas	83	88	171
Chagres fever	..	1	1
Puerperal fever			49
Cirrhosis of liver and hepatitis	153	158	311
Gastritis, enteritis, peritonitis	382	379	761
Cyanosis and atelecta is	70	180	250
Premature and preternatural	327	389	716
Apoplexy	228	288	516
Infantile convulsions	346	385	731
Meningitis	234	349	583
Encephalitis	28	29	57
Sunstroke	38	78	116
Rheumatism	100	72	172
Gout	4	7	11
Accidents and negligence	288	819	1,107
Drowning	34	204	238
Homicide	17	41	58
Hydrocephalus and meningitis	279	338	617
Marasmus, scrofula, etc	344	376	720

The number of deaths from suicide in 1880 was 152, of which 121 were male and 31 female; 34 single, 74 married. Nativity: United States, 35; Germany, 64; Ireland, 20; Switzerland, 3; France, 7; Poland, 3; Scotland, 3; Italy, 3; England, 5. The means employed were:

Gun and pistol	39
Drowning	14
Hanging	28
Cuts and stabs	20
Leaps from windows, etc	9
Inhalation of coal-gas	2
Poison	40

The deaths of children under five years of age were 14,650, or nearly one-half the entire mortality, the number being almost equally divided between males and females.

The building department supervises the erection of new buildings and additions to old structures within the city limits. The superintendent of buildings is nominated by the mayor, and confirmed by the board of aldermen, for a term of 6 years; salary, $6,000. The following are the statistics of building in New York during the past 4 years and in 1871, showing the number of new buildings erected in each ward for each year, from the annual report of the superintendent of buildings:

Wards.	1880.	1879.	1878.	1877.	1871.
First	7	11	5	11	13
Second	3	3	5	1	8
Third	5	2	3	5	15
Fourth	6	5	5	14	15
Fifth	19	17	16	14	24
Sixth	6	5	11	9	25
Seventh	19	14	27	20	67
Eighth	20	29	38	23	28
Ninth	20	41	35	26	72
Tenth	10	10	13	12	56
Eleventh	13	25	13	16	55
Twelfth	900	668	432	280	537
Thirteenth	16	12	11	43	32
Fourteenth	8	13	17	8	25
Fifteenth	13	17	12	13	15
Sixteenth	36	30	28	33	52
Seventeenth	21	19	18	42	65
Eighteenth	18	24	21	22	43
Nineteenth	675	678	505	396	994
Twentieth	47	58	35	65	134
Twenty-first	31	41	37	50	108
Twenty-second	168	162	163	155	400
Twenty-third	138	158	174	145	
Twenty-fourth	21	23	48	29	
Total	2,220	2,065	1,672	1,432	2,782

The following table shows the number of first-class dwellings and French flats erected in each year since 1868:

YEAR.	No. of First-class Dwellings.	Cost.	No. of French Flats.
1868	853	$16,099,450	0
1869	840	16,806,200	1
1870	822	14,055,400	0
1871	1,049	16,923,600	0
1872	499	9,123,250	1
1873	206	4.370,000	0
1874	234	3,759,000	0
1875	382	4,616,500	112
1876	439	5,827,750	115
1877	421	4,802,100	157
1878	525	5,894,000	99
1879	764	10,862,400	253
1880	900	15,000,000	516

Cemeteries.—Intra-mural interment, except in certain specified instances, being prohibited by law in New York, the city's dead are buried in the following cemeteries: Calvary, Cypress Hills, Evergreens, Greenwood, Lutheran, Machpelah, Maple Grove, Marble, New York Bay, Trinity, Union, Washington, and Woodlawn. The last-named is at Woodlawn station, on the Harlem railroad, in the 24th ward; Trinity is at 153d street and 10th avenue; Marble is in 2d street: these three are exempted from the law regarding city burial. Of the remainder, Machpelah and New York Bay are in New Jersey, and the others on Long Island.

City Railroads.—The surface (horse) railroads include the Broadway and University place, to Central park; Broadway and Broome street, to Broadway and Barclay street; Bleecker street, from Fulton ferry to 23d street ferry; Belt line, from South ferry around the city by 59th street, and return; City hall, Avenue B, and 34th street; Dry Dock and East Broadway to 23d street ferry (east side); Eighth avenue, from Broadway and Vesey street to Central park; First and Second avenue, Peck slip to 138th street; Fourth avenue and Madison avenue, City hall to 86th street; Ninth avenue, Broadway and Fulton street to 55th street; Seventh avenue, Broadway and Park place to Central park; Sixth avenue, Broadway and Vesey street to Central park; Third avenue, Astor House to Harlem; and 11 cross-town lines.—*Elevated Railroads.* These are all in the hands of one company, the N. Y. Elevated Railroad Company, and include the Ninth avenue line, from South ferry to 59th street; Second avenue, from South ferry to Harlem; Sixth avenue, from Rector street to the Harlem river; Third avenue, from City hall to Harlem river.—New York is lighted by gas supplied by the following companies: New York, Manhattan, Metropolitan, N. Y. Mutual, Harlem, Central, Northern, and Yonkers. The number of street lamps burning Sept. 30, 1880, was 23,475.—The number of hotels in the city is 68; of apartment houses, 44.—The number of the police force, including surgeons, Dec. 31, 1880. was 2,519.—*The police department* is governed by a board of four commissioners, appointed by the mayor with the concurrence of the board of aldermen; removable (for cause) by the mayor, with the concurrence of the governor of the state. They receive an annual salary of $6,000 each, excepting the person whom they choose to be president of the board, who receives $8,000. The commissioners appoint all the members of the force, including 1 superintendent and 4 inspectors, and make all promotions and dismissals after trial. The city is divided into 30 precincts; each of which has a suitable building, and is under the command of a captain, assisted by a sufficient number of sergeants and roundsmen. Patrolmen receive $1000 per year salary; roundsmen, $1200; sergeants, $1500; and captains, $2,000.—*The public markets*, under the general direction of a superintendent, are the following: Catharine, foot of Catharine street, East river; Central, E. 42d street, opposite Park avenue; Centre, Centre street, from Grand to Broome; Essex, Grand street, from Ludlow to Essex; Fulton, Fulton, Beekman, South, and Front streets; Fulton fish, South street, opposite Fulton market; Jefferson, Greenwich and 6th avenues, and W. 10th street; Tompkins, 3d avenue, between 6th and 7th streets; Union, Houston and 2d streets and Avenue D; Washington, Washington, West, Vesey, and Fulton streets; Market-wagon stand, West, Little 12th, Washington, and Gansevoort streets, for farmers' wagons, and buyers of produce.—*Militia.* The first division, national guard, state of New York, comprises the city militia organization, including 9 regiments of infantry, one regiment and a separate troop of cavalry, and 3 batteries of artillery, a complement of 6,500 men, thoroughly drilled and equipped. The division headquarters is at 155 Mercer street; and the ordnance department and quartermaster-general's department of the state in the arsenal, corner 7th avenue and 35th street.—*Newspapers and Magazines.* The number of morning papers published in the city is 21; there are 8 evening papers, 11 semi-weekly, 195 weekly, 4 bi-weekly, 22 semi-monthly, 172 monthly, 11 quarterly.—*Post-office.* Besides the general post-office in City hall park, there are 19 sub-stations in different parts of the city, and 1000 lamp-post boxes, from which collections are made 7 times daily, except Sundays. Eleven of the sub-stations are designated by the letters of the alphabet, and the remainder by the names of the suburban villages in which they are situated.—*Prisons.* Each police-court has connected with it a prison, viz.: the Tombs, or city prison, in Centre street; Essex Market, in Essex street, between Grand and Broome; Jefferson Market, 6th avenue and W. 10th street; Yorkville, 57th street, between 3d and Lexington avenues; Harlem, 125th street, between 3d and Lexington avenues; and Fordham. Ludlow street jail is used for prisoners from the federal and state courts.

The Stock Exchange is a fine white marble building in Broad street, near Wall, extending back to New street, and having an extension to Wall street. Seats in the exchange are now worth $25,000; only members are allowed on the floor. The heirs of every deceased member receive $10,000, without deduction, from the gratuity fund established by the exchange. There are 1060 members: about 300,000 shares of stock are bought and sold daily, and the amount of the business of each day is about $1,500,000, of which one-third is government bonds.—Among the important buildings deserving notice is St. Patrick's (Roman Catholic) cathedral, occupying the block on 5th avenue between 50th and 51st streets. The building was projected by archbishop Hughes about 1850, and the plans drawn by James Renwick: the corner-stone was laid Aug. 15. 1858, and it was dedicated by cardinal McCloskey, May 25, 1879. The architecture is of the 13th century style, the ground plan being in the form of a Latin cross. The dimensions are: interior length, 306 ft.; breadth of nave and choir, 96 ft., with the chapels, 120 ft.; length of transept, 140 ft.; height, 108 ft.; height of side-aisles, 54 feet. The 5th avenue front comprises a central gable 156 ft. in height, with towers and spires, each to be when finished 330 ft. high. The building is of white marble, with a base-course of granite. The roof is supported in the interior by white marble columns 35 ft. high and 5 ft. in diameter; the ceiling is groined and richly ornamented; the organ-loft is 46 ft. wide and 28 ft. long, of ash, richly molded; the high altar is 40 ft. in height. Total cost about $2,500,000.—The building of the Young Men's Christian association, 4th avenue and 23d street, was erected in 1869, and cost $500,000. It is French renaissance in style, 5 stories high, 175 ft. front and 86 ft. depth. The association was organized in 1852, and furnishes a reading-rooom, lectures, concerts, and evening classes in languages and other branches to its members; subscription, $5 per annum.—Castle Garden, originally a fort, and later and for many years a place of amusement, is now used as a depot for emigrants, for which purpose it has been employed since 1855. It is situated in the Battery park, at the extreme southern end of Manhattan island, convenient for foreign steamers and shipping. It contains at times as many as 1000 immigrants. The business of receiving, caring for, and shipping to their destination the many thousands of immigrants is in charge of 7 commissioners of emigration, 5 of whom are appointed by the governor of the state, the other two being the presidents of the Irish and German emigrant societies, *ex officio*, and these have entire control of the emigrants arriving at this port. During the year ending Dec. 31, 1880, 372,880 persons arrived at this port, of whom 320,607 passed through Castle Garden. Their destinations were: eastern states, 63,868; western states, 112,119; southern states, 6,497; New York state, 137,561; Canada, 1627.

Law Courts.—The first court of law was established in 1626; and this Dutch court was continued in New York until 1665, when it was abolished, by the English governor, and superseded by one composed of the mayor, aldermen, and sheriff, and known as the mayor's court; and this continued in existence until 1821, when it was changed to the court of common pleas. The superior court was created in 1828, with a chief-justice and two associates. The assembly which convened in 1691 created the courts of justices of the peace, and the court of general sessions; also the present supreme court, the court of oyer and terminer being the criminal circuit of the latter. The constitution of 1846 created the present court of appeals. The courts now in existence are: the U. S. circuit court, the U. S. district court, the supreme court, court of common pleas, superior court, court of arbitration (established in 1875), the district courts (of which there are ten), oyer and terminer, special sessions, and six police courts. The law department of the city government is in charge of the corporation counsel, who is appointed by the mayor, confirmed by the board of aldermen, and receives a salary of $15,000 per annum. Under him are the corporation attorney, salary $6,000; and the public administrator, $5,000.

Government.—Under the charter passed April 30, 1873, the government of the city is vested in the "mayor, aldermen, and commonalty of the city of New York." The legislative power is vested in a board of 22 aldermen, holding office for a term of one year from Jan. 1, after election at the general election in November. The executive power is vested in the mayor and heads of departments appointed by the mayor, and confirmed by the board of aldermen, for a term of six years (except in special cases). The mayor is elected at the November general election for a term of two years. The departments are those of finance, law, police, public works, parks, docks, charities and corrections, fire, health, taxes and assessments, and buildings. The salary of the mayor is $12,000, and that of each alderman $4,000 per annum. The finance department is under the direction of the comptroller, who receives a salary of $10,000 per annum. The city chamberlain receives a salary of $30,000, out of which he pays all the expenses of his office. This department has control of all the fiscal concerns of the corporation. The total cash payments from the city treasury during the year ending Dec. 31, 1880, amounted to $60,794,920.04; leaving a cash balance of $1,870,340.88. The total receipts from taxes for the year were $27,712,846.01; the assessed value of real estate in the city for 1880 was $942,571,690, an increase over that of 1879 of $24,437,810. The total bonded debt of the city outstanding, Dec. 31, 1880, was $133,535,019.87. The total valuation, real and personal, for 1880, was $1,143,765,727.09. The assessments upon the shareholders of banks since 1873 have been as follows:

1873	$77,650,395
1874	74,897,570
1875	73,390,989
1876	85,145,116
1877	73,614,274
1878	65,179,320
1879	58,082,970
1880	55,601,607.09

The number of pieces or plots of real estate upon the assessment rolls was, in 1878, 151,058; in 1879, 151,620; in 1880, 152,400. The number of names on personal books in 1880 was 14,764; the number of shareholders of banks, 20,888. The commissioners of public charities and correction, three in number, appointed by the mayor and confirmed by the board of aldermen, have charge of all applications for relief, or admission to hospitals, alms-houses, and nurseries, and voluntary committals to the work-house. The last report of the commissioners is for the year 1878, and shows expenditures for the year, $1,154,619.28. The total number of persons received in the department was 98,188, the average census being 10,454, nearly all passing through the city prisons and Bellevue hospital. The department of docks consists of three commissioners, appointed by the mayor and confirmed by the board of aldermen, for a term of six years, the president of the board receiving a salary of $6,500 per annum, and the other commissioners $3,000 each. The board has charge of renting, building, repairing, etc., the piers and bulkheads along the city water-front. The annual report of the department for the year ending April 30, 1880, shows an expenditure of $599,768.63; the revenues being $809,215.41. The total receipts during the past ten years were $6,028,229.41; the total expenditures for the same period, $7,239,670.17. The city water-front is divided into ten districts, each of which is in charge of a harbor-master, under the supervision and control of the captain of the port: these harbor-masters have charge of the assignment of piers. The port wardens make surveys of vessels deemed unseaworthy, and of damaged cargoes; and also valuations and measurements of vessels and cargoes. Pilots are licensed by the board of commissioners of pilots, and are authorized to demand fees for pilotage, and half-fees where their services are offered, whether accepted or refused.

History.—The history of the city is that of the state until the beginning of the 18th century. See NEW YORK, state. At the close of the 17th c. there were not more than 800 dwelling-houses, and about 5,250 inhabitants, white and black, the latter being in the proportion of about one in six. The first Trinity church was built in 1696; and about 5 years later Wall street had been paved; the city was policed by regularly appointed watchmen; and (in 1711) a slave-market was established. The first Presbyterian church was built in 1719; the first newspaper in the city, the *New York Gazette*, was established in 1725; and a few years later communication with Boston was furnished regularly by stages, which occupied two weeks in making the trip. Severe epidemics of measles and malignant pleurisy are noted as having been very destructive of life during the first quarter of this century; and a pestilent fever, brought from St. Thomas, carried off 1 in 10 of the population in 1702. Zenger's *Weekly Journal*, which was founded in 1733, was prosecuted for libel two years later, and Zenger himself imprisoned—the first attack on free speech in the country. The trouble grew out of a quarrel about a claim for fees between an outgoing and an incoming governor of the colony. The year 1741 brought pestilence, a great fire, and the extraordinary so-called negro plot. See NEW YORK, city, *ante*. The first theater in the city was established in 1750: five years later St. Paul's church was erected. In that year was the popular excitement over the stamp act, which act was publicly burned, and the colonial congress assembled in the city. The year 1765 saw the organization of the sons of liberty, and the movement for freedom from the mother-country was fully begun. In 1770 the statue of George III. in the Bowling Green was destroyed, and the obnoxious duty on tea was resisted; though it was not until 1774 that a ship laden with tea was sent back to England, 18 chests which had been secretly landed being destroyed. Between Aug. 26, 1776, and Nov. 28, 1783, the city was in the hands of the British. See NEW YORK, state. In 1790 the population had grown to 29,906, and the city limits extended to the lower corner of the present city hall park. In 1789 there was an epidemic of yellow fever, which carried off more than 2,000 victims. The corner-stone of the present city hall was laid on Sept. 20, 1803, and the building was finished in 1812. The year 1804 brought a great fire in Wall and Front streets, when 40 stores were destroyed. In 1805 the city had 78,770 inhabitants. In 1807 Robert Fulton made his first steamboat voyage to Albany, and 5 years later commenced running the ferries to Long Island by steam. The first experiments with gas-lighting were made in 1812, but gas was not generally used until 1825. The first boat from the Erie canal arrived in the month of November in the latter year. In 1832 an epidemic of cholera carried off 3,500 persons, and 2 years later appeared again with a mortality of about 1000. The great fire of 1835 occurred Dec. 16, and destroyed the whole east side of the city below Wall street, including 648 stores, the merchants' exchange, and the South Dutch church, the entire loss being $18,000,000. In 1837 a financial panic brought failures, suspensions, and general loss to the entire country. In 1840 the population was 312,700. The Astor place riot in 1849, and the cholera epidemic of that year, which destroyed 5,071 persons, were the important events of the first half of the present century. The first city railroad was built in 1852, and on July 14, 1853, the Crystal palace industrial exhibition was opened to the public with striking ceremonies, the president of the United States officiating. A second financial panic occurred in 1857, with the usual following of suspensions of banks and business failures. This year witnessed the riotous demonstrations growing out of a conflict between two police organizations under the mayoralty of Fernando Wood, for whose arrest an order was issued and resisted, the 7th regiment of militia at length being called in to protect the public peace and carry out the law. Rioting recommenced on July 4, and 11 persons were killed. From 1860 to 1865 the city was engaged in patriotic and generous service in behalf of the union, threatened by the secession of the southern states. In the fall of 1873 occurred the great financial panic which began with the failure of Jay Cooke & Co., heavily embarrassed with the affairs of the Northern Pacific railroad. During several years at this period took place the investigation into the acts of the so-called "Tweed ring," by which, through malfeasance in office, the city had been plundered of many millions of dollars. The arrest, trial, and condign punishment of most of the offenders and the death of Tweed himself in prison formed the conclusion of this scheme to despoil the city.

NEW YORK, COLLEGE OF THE CITY OF, is the only free college supported by city taxpayers in the United States. It began its existence as the free academy in 1848, having first received the sanction of a popular vote, and its present title was bestowed upon it in 1866. Standing at the head of the public school system, its trustees are the members of the board of education together with the president of the college. It has had but two presidents, Horace Webster. LL.D., and from 1869, Alexander S. Webb, LL.D. The other officers comprise 14 active professors and 3 emeriti, and 21 tutors. Tuition, books, and stationery are free, all expenses being paid on presentation of vouchers to the comptroller of the city, who disbursed in 1878–79, for this institution, $131,535.48. Candidates for admission to the college must be 14 years of age, have attended a public school for at least one year, and must pass an examination on the studies taught in the grammar schools. Students have the option of a five years' classical or scientific course, the first year being considered introductory; there is also a commercial course for introductory students remaining but one year, and a post-graduate course of civil engineering. Since its foundation the college has had over 10,000 students. The year 1879–80 began with 1260 students, of whom 737 were in the introductory and 523 in the collegiate classes, and the graduating class of 1879 numbered 51. The buildings and grounds on the s.e. corner of Lexington av. and e. 23d st. are valued at $190,000; the library of 18,000 volumes at $59,000; the apparatus, cabinets, casts, models, etc. at more than $20,000; and the institution has library and medal funds aggregating $40,750.

NEW YORK, UNIVERSITY OF THE CITY OF, was chartered in 1831, and began to receive students the next year. Its present building on the e. side of Washington sq. was completed in 1835; it is 180 ft. long by 100 ft. in width, of white freestone. The medical department is located at the foot of e. 26th st. opposite Bellevue hospital. The faculty of the four departments of the university consists of a chancellor and 63 instructors; embracing 15 professors and two adjunct professors in the arts and sciences; a president and 4 professors of law; and 20 professors, 5 lecturers, and 16 assistants in medicine. In 1878 the number of students was 725, divided into 138 students of the arts and sciences, 6 in the school of art, 72 in the law, and 509 in the medical departments. There were 239 graduates from all the departments the same year. The tuition fee of $80 a year was abolished for the academical department about 1870, and each student now pays but $15 annual dues for incidental purposes. The university is supported by the fees of its law and medical students, the rent of a portion of its main building, and the interest on an invested endowment of nearly $200,000. Its buildings are valued at $300,000, libraries at $23,000, and furniture and scientific apparatus at $10,000. The first chancellor of the institution was the rev. Dr. James H. Matthews, and the rev. Dr. Howard Crosby has held the office since 1870.*

NEW ZEALAND, a British colony in the south Pacific ocean, consists of three islands, two large and one much smaller, and of a number of islets scattered round the coasts. These islands, which are named respectively north, south (sometimes also middle), and Stewart's island, are situated 6,500 m. w. from the coast of south America, and about 1200 m. s.e. of Australia. The group is irregular in form, but may be said to extend from the s. in a n.n.e. direction, and like the peninsula of Italy, resembles a boot in shape. North island is 500 m. long, and 200 m. in greatest breadth from e. to w.; south island is 550 m. long, and 210 m. in greatest breadth; Stewart's island is triangular in shape, and has an area of about 900 square miles. Area of the three islands about 100,000 sq. miles. The north is separated from the south island by Cook's strait, which is 18 m. wide at its eastern and 90 m. wide at its western end; the south is separated from Stewart's island by Foveaux strait, which averages about 20 m. in width. The group extends in lat. from 34° 15′ to 47° 30′ s., and in long. from 166° to 179° e.; being thus almost the antipodes of the British isles.

Coast Line.—Of the entire coast line of about 4,000 m., nearly 1500 m. is formed by the shores of north island, which are deeply indented, and contain many excellent harbors. Commencing from north cape, and going s.e. round the island, the chief harbors are Monganui, Wangaroa, the bay of islands, Auckland, Mercury, and Tauranga bays, and the ports of Wellington, Manukau, and Hokianga. On the n. and s. coasts of south island, which are much broken, the harbors are numerous and excellent; on the eastern coast, the principal harbors are Akaroa, Victoria, and Dunedin. On the coast of Stewart's island, there are also good ports.

Surface.—The New Zealand islands are of volcanic origin, and a great portion of the entire area is occupied by mountains, among which are many extinct and a few active volcanoes. In north island, mount Ruaperhui, the highest summit of the central range, is 9,100 ft. in height, and is capped with perpetual snow, In the same range is Tongariro, an active volcano, 6,500 ft. high. A continuous range of mountains runs along the western coast of south island, and assumes the form of table-lands and isolated peaks toward the east. This range rises in mount Cook to about 13,000 feet. In Stewart's island, the greatest elevation is about 3,000 feet. In north island, the mountains are mostly clothed with evergreen forests of luxuriant growth, interspersed with fern-clad ranges, and occasionally with treeless grassy plains; extensive and rich valleys and sheltered dales abound; and in the east of south island there are many expansive plains of rich meadow-land, admirably adapted either for agriculture or cattle-breeding. Water and water-power are found in great abundance in the colony, and the numerous rivers are subject to sudden floods from the melting of the mountain snows. As a rule, however, the streams are short, and are not navigable for more than 50 m. above their mouths. The chief is Waikato river, in north island, which, issuing from the Taupo lake (30 m. long by 20 broad), flows in a northern direction for 200 m., and reaches the sea on the w. coast. In south island, the rivers Clutha, Mataura, and Waiau, all flowing s., are among the chief. Around lakes Rotomahana and Rotorua are a number of grand and beautiful geysers, which throw up water heated to 2° above the boiling-point. The geology of New Zealand is remarkable in a high degree. The mountains, which are of every variety of outline. are chiefly composed of the lower slate-rocks, intersected with basalt, and mixed with primary sandstone and limestone. Beds of coal and lignite exist, and the former have been to some extent worked.

Soil, Climate, and Productions.—Of the whole surface-extent of New Zealand (nearly 70,000,000 acres, little short of the combined area of England and Wales, Scotland, and Ireland), one-fourth is estimated to consist of dense forests tracts, one-half of excellent soil, and the remainder of waste lands, scoriæ-hills, and rugged mountain regions. Nearly 40,000,000 acres are supposed to be more or less suitable for agriculture and cattle-breeding. The soil, although often clayey, has in the volcanic districts more than a medium fertility; but the luxuriant and semi-tropical vegetation is perhaps as much due to excellence of climate as to richness of soil. Owing to the prevalence of light and easily-worked soils, all agricultural processes are performed with unusual ease. The climate of New Zealand is one of the finest in the world. The country contains few physical sources of disease: the average temperature is remarkably even at all seasons of the year, and the atmosphere is continually agitated and freshened by winds that blow over an immense expanse of ocean. In a word, the climate much resembles that of England, with half the cold of the English winter; while the summer is longer and somewhat warmer, the atmosphere is more breezy and pure, and there are many more fine days throughout the year. In north island, the mean annual temperature is 58°; in south island, 52°. The mean temperature of the hottest month at Auckland is 68°: and at Otago, 58°; of the coldest month, 51° and 40°. The air is very humid, and the fall of rain is greater than in England, but there are more dry days. All the native trees and plants are evergreens. Forrests, shrubberies, and plains are clothed in green throughout the year, the results of which are, that cattle, as a rule, browse on the herbage and shrubs of the open country all the year round, thus saving great expense to the cattle-breeder; and that the operations of reclaiming and cultivating land can be carried on at all seasons. The seasons in New Zealand are the reverse of ours; January is their hottest month, and June the coldest. All the grains, grasses, fruits, and vegetables grown in England are cultivated in this country with perfect success, being excellent in quality and heavy in yield; while, besides these, the vine is cultivated in the open air, and maize, the taro, and the sweet-potato are cultivated to some extent in the sunny valleys of north island. The entire acreage under crop in New Zealand in 1851 was 29,140; in 1858, it was 141,007: in 1876, 2,230,988, while in 1871 the total acreage fenced was 6,778,733. Of the crops, the principal were wheat, oats, barley, potatoes, and sown grass, which, under ordinary circumstances, are grown to great advantage in New Zealand. Besides a few harmless lizards, a small species of rat is the only indigenous four-footed animal found in either of the great islands. Hawks are numerous. The country is destitute of snakes, and possesses no insect so noxious as the English wasp. The pig, introduced by Cook, runs wild, and the red and fallow deer, the pheasant, partridge, quail, etc., and the commoner domestic animals introduced by colonists, thrive well. In March, 1874, there were in the colony 99,859 horses, 494,917 cattle, 11,704,853 sheep, 123,921 pigs, and 1,058,198 heads of poultry, besides mules, asses, and goats. Coal in in abundance, and of good quality, as well as iron, gold, silver, tin, copper, etc, are distributed over the colony. For statistics of the quantity of gold exported, see article OTAGO. Valuable timber is in great abundance. In 1877, the revenue (of which the sources are principally customs' receipts, and sale of crown lands, amounted to £3,790,545; the debt of the general government to £20,691,111. In 1875, the debt was under £14,000,000. The exports, consisting principally of wool, corn, gum, preserved meat, and gold, amounted, in 1877, to £6,329,251; the wool of that year being valued at £3,112,469. The total exports of gold from 1857 to 1875 were 7,955,295 oz., in value £30,984,786. The imports, consisting ot British manufactures, etc., amounted to £6,973,418 in 1877. At the end of 1877 there were 720 m. of railways in operation, and 427 in course of formation; there were also 7,200 m. of telegraphic wires erected, with 142 stations. The revenue of the post-office in 1876 was £129,263.

The colony was divided into the following nine provinces: Auckland, Taranaki, Wellingten, Hawke's Bay, Nelson, Marlborough, Canterbury, Otago, and Westland. The provinces were abolished by the colonial parliament in 1875, and a system of counties substituted. The government is administered by a governor appointed by the crown, and a ministry, a legislative council nominated by the crown, and a house of representatives elected by the people. National schools—maintained by a capitation tax of 10s. per child, and not more than £2 per family—various colleges, and a university in Otago, are the principal educational institutions. A very large proportion of the population of European descent can read and write, more particular in Otago. The principal churches are the Church of England, predominating in Canterbury; the Presbyterian church, which predominates in Otago and Southland; the Wesleyan; and the Roman Catholic. In 1875 the immigrants into New Zealand amounted to 31,737 persons; the emigrants from it, to 6,467; leaving a balance of 26,270 in favor of immigration. The population in 1858 was 59,328; in 1871, 256,260; and in 1876, 399,075. The New Zealanders, or Maoris (q.v.), estimated, in 1867, at 38,540, and in 1875, at 45,470, are mostly located in North island. The military and civil forces of New Zealand are the volunteers, numbering 6080 of all ranks, and the armed constabulary, consisting of 728 men, of whom 84 are mounted. The hospitals and charitable institutions are numerous.

New Zealand was discovered by Tasman in 1642, and was repeatedly visited by capt. Cook, who surveyed the coast in 1770. After the settlement of Port Jackson, in New South Wales, the English and American whaling ships had recourse to the coast of New Zealand for provisions and shelter. New Zealand flax came also to be an article of traffic, and individual Englishmen began to settle on the coasts, and intermarry with the natives, and acquire land in right of their wives or of purchase. Missionary enterprise began in 1814, favored by various chiefs, and the missionaries not only labored to convert the natives, but introduced improved culture among them, and tried to protect them from the injustice, fraud, and oppression of the Europeans that had acquired settlements. A British resident or consul was appointed in 1833, but without authority. To put an end to the state of anarchy induced by a disultory colonization, and the purchase of lands for a few hatchets or muskets, a lieutenant-governor was appointed in 1840, and a treaty concluded with the native chiefs, whereby the sovereignty of the islands was ceded to Britain, while the chiefs were guaranteed the full possession of their lands, forests, etc., so long as they desired to retain them: the right of pre-emption, however, was reserved for the crown, if they wished to alienate any portion. Thus New Zealand became a regular colony, the seat of Government of which was fixed on the bay Waitemata, and called Auckland. The previous year an association, called the New Zealand company, had made a pretended purchase of tracts amounting to a third of the whole island, and for a dozen years most of the colonization of New Zealand was conducted under its auspices. The conduct of the company is considered to have been on the whole prejudicial to the prosperity of the colony; and after a long conflict with the government, they resigned, in 1852, all their claims—which the government had never confirmed—on condition of receiving £268,000 as compensation for their outlay. The unscrupulous way in which the company and others often took possesion of lands brought on, between 1843 and 1847, a series of bloody conflicts with the warlike natives, whose hostility, after having subsided for some time, in 1861 again broke out in a series of intermittent struggles. These continued until, on the withdrawal of the imperial troops, the colonists, from their knowledge of bush life and intensified earnestness, completely subdued the refractory natives, who are now turning their attention to agriculture and trade. In 1852 constitutional government was established, and in 1865 the seat of government was transferred from Auckland to Wellington, the present capital.

NEW ZEALAND FLAX. See FLAX, NEW ZEALAND.

NEXT FRIEND is, in English law, the name given to the person in whose name, or rather by whose agency, an infant—i.e., a person under the age of 21—sues in the courts of law and equity. The object is chiefly to have some party responsible for costs in case the infant fails in the action. In practice, the father, if alive, is usually the next friend, but any substantial person may be so. In the court of chancery, a married woman sues or appears by the intervention of a next friend, where she is personally interested.

NEY, MICHEL, a celebrated marshal of the first French empire, was the son of a cooper, and was born at Saarlouis, Jan. 10, 1769. He was a non-commissioned officer in a hussar regiment when the revolution began, and afterwards rapidly rose to high military rank. For the capture of Mannheim by a *coup de main*, he was made a general of division in 1799. He was interim commander of the army of the Rhine for a short time, during which he frustrated by a bold diversion an important movement of the archduke Charles against Massena and the army of Switzerland. After the peace of Luneville, Bonaparte, anxious to win Ney, with other republicans, to his party, brought about his marriage with a young friend of Hortense Beauharnais, and appointed him inspector-general of cavalry. On the establishment of the empire, he was made a marshal. In 1805 he stormed the intrenchments of Elchingen, and was created duke of Elchingen. He afterwards rendered important service in the Tyrol; contributed much to the French successes of 1806 and 1807; and served in Spain with great ability in 1808 and 1809, till he was dismissed by Massena, the commander-in-chief, on a dispute about the plan of the campaign. Chagrined by this, and dissatisfied with Napoleon's despotism, he remained for some time inactive; but in 1812 received the command of the third *corps d'armée*, and greatly distinguished himself at Smolensk and the Moskwa, in consequence of which he was created prince of Moskwa. He also displayed great abilities in the French retreat. He had a principal part in the campaigns of 1813 and 1814, but after the capture of Paris, he urged the emperor to abdicate, and submitted to Louis XVIII., who loaded him with favors. On Napoleon's return from Elba, Ney assured the king of his fidelity, and was sent against Napoleon at the head of 4,000 men; but finding the emperor to be received with general enthusiasm, and his own soldiers to be favorable to his cause, Ney went over to his side. In the battle of Waterloo, he commanded the center, and had five horses shot under him. After the capitulation of Paris, he yielded to the entreaties of his family to retire to Switzerland; but a costly Egyptian saber, the gift of Napoleon, led to his being suspected by an official, and arrested. He was condemned to death for high treason, and was shot in the garden of the Luxembourg on the Dec. 7, 1815. He left three sons, who published his *Mémoires* (2 vols. Par. 1833).

NEZ PERCÉS, a co. in n.w. Idaho, bounded w. by Washington territory; drained by the Clearwater, Salmon, and Lewis or Snake rivers; about 6,000 sq.m.; pop., 1870, 1,607—747 Chinese. In the e. part, which is mountainous, gold is found; in the central the surface is level and adapted to farming. The reservation of the Nez Perces Indians lies further west. Wheat, oats, barley, potatoes, and dairy products, are the staples. Co. seat, Lewiston.

NEZ PERCÉS INDIANS, vs. SAHAPTIS, a tribe of Indians now occupying large reservations in Idaho territory and in n.e. Oregon, to which they were removed from Washington territory and Oregon. They made a treaty with capt. Lewis and Clarke about 1805. From 1832 to 1847 a Christian mission was maintained among them. The tribe has generally been friendly to the whites, but has not attained a high degree of civilization. In 1854 a treaty was made by a part of the tribe, now known as treaty Indians, but a large number held out against it and these are often engaged in war with the Sioux. Among the reservation Indians' missions have been established, and books have been printed in their language, which have many grammatical peculiarities. They own large droves of cattle and horses. There are now about 1,600 Indians on the reservation.

N'GA'MI, LAKE. The existence of lakes in the interior of Africa was vaguely known as far back as the days of Herodotus; and the earliest modern maps show at least a dozen large and small, one of which is about the size, and very nearly in the position of that shallow reservoir of surface drainage which was discovered, or at least first visited, by a European in 1849, when Dr. Livingstone and Mr. Oswell, who were aware of its existence from native report, reached its shores by a circuitous route from the Cape Colony. Although since ascertained to be of little importance in the physical geography of these regions, lake N'gami was at first supposed to be in some way connected with the larger inland seas of Nyassa, Victoria Nyanza, and Tanganyika. It is situated between the 20th and 21st parallels of s. lat., and between the meridians 22° 10' and 23° 30' e. long., at a height of about 2,500 ft. above the level of the sea, and is connected by a series of sluggish anastomosing streams with the river-system of the Zambezi; its extent as well as depth varies with the fall of rain in the country to the n. of it, but its average size may be taken at 70 m. long, by a breadth of 20 and a depth varying from 3 to 28 feet. In 1853 lake N'gami was reached from the w. coast near Walfish bay by the traveler Andersson, and there is now a well-beaten route for traders between these two places, and a considerable quantity of ivory and ostrich feathers are annually collected in the neighborhood of the lake. The principal characteristics of the region are rivers, with very sluggish current, and often flowing in different directions to and from the lake, large salt pans and extensive dry flats, covered with dense bush, the haunt of elephants and other large animals. The water of N'gami is generally fresh, but in the dry season becomes brackish. The e.

end is much deeper than the western, and it has been inferred that during the last c. the shape and size of the lake have undergone material alterations. The chief tributary, the Tonke or Tioge, coming from the n.w., is deep, and in June, July, and August brings down vast volumes of water. The Suga or Zouga is the main outlet, runs towards the s.e., and finally disappears in a large salt-marsh.

NGAN-KING, a large and wealthy city of China, the capital of the province of Ngan-whi. It stands on the left bank of the great river Yang-tze-Kiang, 190 m. s.w. from Nankin. The surrounding country is highly cultivated and very densely peopled. The mineral riches of the neighborhood are also considerable. Ngan-King is a place of busy trade, great part of the goods intended for Nankin passing through the hands of its merchants. The trade is carried on by means of vessels on the river. Porcelain and cloth are among the principal articles of trade.

NGAN-WHI, or NGAN-HOEI, an interior province of China; bounded n.e. by Kiangsoo, s.e. by Chekiang, s. by Kiangsee, on the w. and n.w. by Houpe and Honan; drained by the Hoai-ho and Yang-tse-Kiang rivers and their tributaries; 48,461 sq.m.; pop. 34,168,059. The surface is mostly level, but broken to the s. and w. by ranges of hills of no great elevation. It contains a number of lakes, of which Chan-Hu or Nest lake is the most important. There are mines of gold, silver, copper, and other metals. The best green tea in China is grown in the s.e. portions of this province. Inks, varnish and lanterns are manufactured.

NIAGARA, a river of North America, which flows from lake Erie northwards into lake Ontario. It is about 36 m. in length, and its descent from the level of one lake to that of the other is about 834 feet. On issuing from lake Erie it is three-quarters of a mile broad; but as it flows on, it becomes several miles wide, making room for a number of islands, the largest of which, Grand island, is 12 m. long, and from 2 to 7 broad. At the foot of Grand island, which reaches within 1½ m. of the *falls of Niagara*, the river is contracted to a breadth of 2½ m., and grows narrower as it proceeds. By this and by the descent in the channel, which is about 60 ft. in the mile above the falls, are produced the swift currents known as the *Rapids*, in which the river, notwithstanding its great depth, is perpetually white with foam. At the falls, which are 22 m. from lake Erie, the river is divided by an island containing about 75 acres, called Goat island; but in consequence of a bend in the channel, by far the larger portion of the water is sent down by the Canadian side. On this side, therefore, is the grander cataract which has been named the *Horseshoe fall*, but no longer bears the name appropriately, as the precipice has been worn from a curved into a somewhat angular shape. This process of wearing away goes on gradually still, a large projection on the Canadian bank, known as the Table rock, having partly fallen off in 1868. The Horseshoe fall is above 600 yds. in breadth, and about 154 ft. in height. The water is so deep that it retains its green color for some distance below the brow of the precipice; and it rushes over with such force that it is thrown about 50 ft. from the foot of the cliff. One may thus, having donned an oil-skin dress, enter two or three yards behind the curved sheet of water; but the spray is so blinding, the din so deafening, and the current of air so strong, that it requires a tolerably calm nerve and firm foot. The separation caused by Goat island leaves a large wall of rock between the Canadian and American falls, the latter being again divided by an islet at a short distance from Goat island. This fall is from 8 to 10 ft. higher than the Horeshoe, but only about 220 yds. broad. A little above the fall the channel is divided by Bath island, which is connected by bridges with Goat island and the American shore. A small tower, approached from Goat island, has been built on a rock over the brow of the Horseshoe fall; and from this the finest view on the American side may be obtained, the Table rock on the Canadian side giving the completest view of the entire cataract. The falls can also be seen from below on both sides, and every facility is given for viewing them from all the best points, while magnificent hotels, Canadian and American, offer their inducements to the tourist to stay till he has received the full influence of the scenery. The river is crossed about 200 or 300 yds. below the falls, where it is 1200 yds. broad. The current is lessened for about a mile, but increases again as the channel becomes narrower and the descent greater. Between 3 and 4 m. below the falls, a stratum of rock runs across the direct course of the river, which, after forming a vast circular basin, with an impassable whirlpool, is forced away at right angles to its old channel. The celebrated wire suspension bridge for the Great Western railway, with a road beneath for vehicles and foot passengers, crosses the river 1½ m. below the fall; it is 800 ft. long, 40 broad, and 200 ft. above the surface of the water.

NIAGARA, a co. in the w. of New York on lake Ontario, traversed by the New York Central railroad and branches and by the Erie canal; 558 sq.m.; pop. '70, 50.437. The land is, for the most part, level, fertile, and well-cultivated; chief products, wheat, Indian corn, oats, and barley. The number of manufacturing establishments was in 1870, 421. They included flour mills, saw mills, woolen mills, and agricultural-tool works. Co. seat, Lockport.

NIAGARA, chief t. in Lincoln co., in the Canadian province of Ontario, is situated on lake Ontario, at the mouth of the river Niagara, and is distant by water from Toronto 36 miles. Burned down in Dec. 1813 by the American gen. M'Clure on his retreat, it was afterwards rebuilt, and promised to be a flourishing town; but its trade has fallen off within the last few years, and its population has decreased to about 3,000.

NIAGARA FALLS, a village in Niagara co., N. Y., on the Niagara river; pop. about 3,000. It contains several small hotels, and depends for its prosperity chiefly on the visitors to the falls.

NIAGARA RIVER AND FALLS (*ante*), received their name from the Indians, in whose language the word *Niagara* means the "thunder of water." A record of a voyage in 1535 by a French mariner named James Cartier contains, it is believed, the first printed allusion to either. In 1603 the first map of the district was constructed by a Frenchman named Champlain; and 75 years later the river and the cataract were visited by Father Hennepin and described at some length in a book. The river receives the waters of all the upper lakes—the Erie, St. Clair, Huron, Michigan, Superior, and a number of smaller ones; and neither the snows of winter nor the evaporation of summer, neither rains nor drought, materially affect it. Its waters flow on, full and clear, perpetually the same, with the exception that about once every seven years they have a gradual rise and fall, which is attributed to some undiscovered disturbance that affects lake Erie. From the foot of the falls to Lewiston, a distance of 7 m., the river descends 104 ft., running between perpendicular walls 250 ft. high; then the height of the chasm gradually diminishes the next 7 m., and during the remainder of its course to lake Ontario, until it is only about 25 feet. It has long been a theory with geologists that this deep chasm, and consequently the gigantic cataract, has been made by the action of the water on the limestone strata through countless ages. Originally, it is believed, the falls were simply from the plateau that overlooks lake Ontario at Lewiston. Within the short period even of less than a hundred years many changes have occurred that are significant in connection with this opinion. In 1818 large parts of the edge of the precipice on the American side of the falls broke down; in 1828 fragments descended from the Horseshoe falls; and since 1855 several other pieces have broken away. An able report of prof. James Hall, in 1842, for the state geological survey, also shows that the falls at that time were different in important respects from the description given of them by Father Hennepin, who described a third fall from the Canadian side toward the e., facing the line of the main fall, and caused by a great rock that turned the divided current in this direction. Sir Charles Lyell—in whose work, *Travels in North America*, may be found the most complete accounts of Niagara—estimates that the falls wear away about one foot of the precipice every year.

NIARE, *Bos brachicheros*, the wild ox or buffalo of tropical Western Africa, is in size and weight about equal to the smaller breeds of British oxen, but of greater strength. The head is rather small, the muzzle black, the ears long and pointed, and fringed with beautiful silky hair, several inches long. The horns are 10 or 12 in. long, curved backwards, and sharply pointed. The animal is gracefully proportioned, having nothing of the clumsiness of the common buffalo. The body is covered with a coat of thin red hair. The tail is tufted at the extremity with black hair several in. long. Herds of these oxen were seen by Du Chaillu in the open or prairie lands to the s. of the mouth of the Ogobai. They are shy and fierce; if wounded, they turn upon the hunter with terrible fury. No attempt seems yet to have been made to domesticate this animal, which is probably very capable of it, and might be found more suitable than other oxen for warm climates.

NIAS, an important island belonging to Holland, lies to the w. of Sumatra, in 0° 18′ 54″—1° 35′ n. lat., and 97°—98° e. long., and has an area of about 1,575 sq. miles. In 1857, when the Dutch took complete possession of the island, the population was reckoned at 170,000. There are several places where ships can anchor and take in provisions, water, etc. On the e. coast is the village of Nias, and on the w. Silorongaug. Little islands and coral reefs lie here and there on the coast, which in some places is steep, while mountain-chains run from the s.e. to the north-west. There is a greater breadth of excellent farming-grounds than the population, reduced by internal wars and the exportation of slaves, can properly cultivate. They grow rice, cocoa-nuts, bananas, tobacco, sugar-canes, etc., and annually about 110,000 lbs. of pepper. Cattle and horses have been imported, and they pay great attention to the raising of pigs and fowls. Formerly, about 500 Niassers were carried away annually as slaves to Batavia and other places, and though this traffic has been in a great measure suppressed, it is still to some extent carried on.

The Niassers are of the Malay race, but fairer than the Malays usually are. They are gentle, sober, and peaceful, remarkably ingenious in handicraft, ornamenting their houses with wood-carvings, forging arms, etc. The women labor in the fields, the children weave mats, while the men look after the live-stock, and hunt the deer and wild swine. They worship a superior deity, and fear a powerful one, who pursues them if they do evil. Polygamy is permitted, but is rare. The gift to the bride's family is from 60 to 500 dollars. Divorce is not allowed, and adultery is punished by the death of both parties. Dead bodies are placed in coffins above the ground, and creepers and flowering shrubs planted, which speedily grow up and cover them. Trade is on the increase.—See *Malayan Miscellanies*, vol. ii.; *Het Eiland Nias, door* H. J. Domis; Crawford's *Descriptive Dictionary* (London, 1856); *Tydschrift voor Ned. Indië*, 1854, 1860, etc.

NIASSA. See NYASSA, *ante.*

NIBBY, ANTONIO, a Roman archæologist of high celebrity, was b. in 1792. He was one of those who, following in the footsteps of Winckelmann, made an elaborately minute investigation of the remains of antiquity their special study. The first work that made him known was his translation of Pausanias, with antiquarian and critical notes. In 1820 he was appointed professor of archæology in the university of Rome. In the same year appeared his edition of Nardini's *Roma Antica;* and in 1837–38, his learned and admirable *Analisi Storicotopografico-antiquaria della curta de Contorni di Roma*, to which was added (1838–40) a description of the city of Rome itself. Among his other writings, may be mentioned his *La Mura di Roma disegnate da W. Gell*, and a large number of valuable treatises on the form and arrangement of the earliest Christian churches, the circus of Caracalla, the temple of Fortuna at Præneste, the graves of the Horatii and the Curiattii, etc. Nibby d. Dec. 29, 1839.

NI'BELUNGENLIED, or '*Niebelunge Not,*' as the words are written in the oldest manuscripts, is one of the most finished specimens of the genuine epic of Germany belonging to the middle ages. There exist twenty more or less perfect manuscript copies of this curious poem, the earliest of which belong to the beginning of the 13th c., from which period till the middle of the 16th c. it enjoyed the greatest popularity among Germans of all classes. Nothing certain is known of the author or authors of the work beyond the fact, that it was put into its present form by a wandering minstrel in Austria about or prior to the year 1210, which is the date of the oldest accredited manuscript. According to W. Grimm and Lachman's critical analysis of the poem, it is in itself a compilation of pre-existing songs and rhapsodies, strung together into one whole upon a plan remarkable for its grand simplicity, although less skill is shown in some instances in the manner in which the several parts are connected. In the more authentic manuscripts the poem consists of only twenty parts, and it is conjectured that the latter portions of the epic, which are given only in some of the texts, as that of St. Gall, are the composition of later compilers. The epic cycle embraced in the Nibelungenlied may be more specially regarded as the fusion of the history of the mythical people, called in the poem the Nibelungen, with five leading groups of myths, in which are incorporated the adventures of some of the most universally popular personages belonging to the semi-historic myths of mediæval German folk-lore, as, for instance, the hero Siegfried with his mantle of invisibility, and the lovely Icelandic heroine Brunhilt; King Günther of Burgundy, and his fair sister, Kriemhilt, the wife of Siegfried; Haco of Norway, Dietrich (Theodoric the great king of the Ostrogoths) of Berne (Verona), and Etzel (Attila), king of the Huns. The loves and feuds, and the stormy lives and violent deaths of these national heroes and heroines, are skillfully intertwined in the Nibelungenlied, and artistically made to center round the mythical treasure of the Nibelungen, which, after the murder of Siegfried, who had brought it from the far north, is secretly buried by his murderer Haco beneath the Rhine, where it still remains. The poem, in its rude but strict versification, tells the tale of Kriemhilt's vengeance for her husband's death with a passionate earnestness that carries the sympathies of the reader with it, until the interest culminates in the catastrophe of the fierce battle between the Burgundians and Huns at the court of Etzel, whose hand Kriemhilt has accepted, the better to accomplish her purposes of revenge. The tale of horrors fitly closes with the murder of Kriemhilt herself, after she has satisfied her vengeance by slaying with Siegfried's sword his murderer Haco. This tale, which seemed to echo back the clash of arms and strife of passion which characterized the early periods of German history, kept a firm hold on the imaginations of the people till the taste for polemic writings, fostered, if not created, at the period of the reformation, caused this as well as many other treasures of folk-lore to be almost lost sight of and forgotten. Attention was again, however, drawn to it in the 18th c., by the publication of detached portions of the poem by Bodmer, *Criemhilden-Rache* (Zurich, 1751), and by Müller in his *Sammlung deutscher Gedichte aus dem* 12–14 *Jahrh.* (Berlin. 1782); but it was not until comparatively recent times that the value of the work in an historical and philological point of view was recognized. Lachmann made known the result of his investigations in 1826. His views were supported by Müllenhoff and Rieger (1856). Holtzmann (1854), on the other hand, asserted that the longest version is the more ancient, and was followed by Zarncke, Hermann, and Fischer. Pfeiffer tried, in 1862, to prove that the author of the present Nibelungenlied was the Austrian Von Kürenberg (*circa* 1140). See Paul's statement of the case in *Die Niébelungenfrage* (1877 All the manuscripts in the Nibelungenlied comprise another poem under the title of *Die Klage*, which treats of the burial of the heroes who fell in the conflict at Etzel's court, and the laments which were composed in commemoration of that event. It is of greater antiquity than the Nibelungenlied, and, like it, the work of an unknown author. A critical analysis of the Nibelungenlied will be found in Carlyle's *Miscellaneous Essays*

NICÆ'A. See NICE.

NICARA'GUA, a republic of Central America, bounded on the n. by the republic of Honduras, on the w. by the Carribean sea, on the s. by the republic of Costa Rica, and on the e. by the Pacific; lat. 10° 45' to 15° n.; long. 83° 20' to 87° 30'; area about 48,000 sq.m.; pop. estimated at 250,000, of whom about 80,000 are whites, 10,000 negroes, the rest Indians and Mestizoes. Nicaragua is traversed by two ranges of mountains—the western, which follows the direction of the coast-line, at a distance of from 10 to 20 m. from the Pacific; and the eastern (a part of the great range of the Cordilleras), which runs nearly parallel to it, and sends off several spurs towards the Carribean sea. The former is generally high and volcanic, but sinks at times almost to the level of the plains. Between the two ranges lies a great interior basin, containing the lakes of Nicaragua (q.v.) and Managua. The principal rivers are the Rio Coco, or Segovia, forming part of the boundary between Honduras and Nicaragua; the Escondido, or Blewfields; and the San Juan, all of which flow into the Carribean sea. The eastern coast of Nicaragua is called the Mosquito coast. The country is in many places densely wooded—the most valuable trees being mahogany, logwood, Nicaragua wood, cedar, and Brazil wood. The pastures are splendid, and support vast herds of cattle. The chief products are sugar-cane (softer and juicier than the Asiatic variety), cacao, cotton, coffee, indigo, tobacco, maize, and rice, with nearly all the fruits, etc., of the tropics—plantains, bananas, tomatoes, bread-fruit, arrow-root, citrons, oranges, limes, lemons, pine-apples, guavas, etc. The chief vegetable exports are sarsaparilla, aloes, ipecacuanha, ginger, copal, gum-arabic, caoutchouc, etc. The northern part of Nicaragua is rich in minerals—gold, silver, copper, iron, and lead—but the mines are not so carefully worked now as under the Spaniards. The incessant political distractions of the country have notoriously all but destroyed the material prosperity of the country. The trade is chiefly with Great Britain. In 1876 the exports amounted to $1,460,596; the imports to $1,031,098. The seat of government is Managua, with 8,000 inhabitants; the largest town and former capital is St. Leon, with a population of 25,000. The town of Nicaragua (q.v. in SUPP., Vol. X.) has a pop. of 8,500.

Nicaragua was discovered in 1521 by Gil Gonzales de Avila, and conquered by Pedro Arias de Avila, the governor of Panama in 1522. In 1821—the great year of revolution in Central America—it threw off allegiance to Spain, and after a desperate and bloody struggle, secured its independence by the help of the "liberals" of San Salvador. Nicaragua now became the second state in the federal republic of Central America, but on the dissolution of the union in 1839 became an independent republic. In 1847-48 a dispute broke out between Nicaragua and Great Britain about the Mosquito coast, which led to some hostilities, and was only finally settled in 1860. Meanwhile, in 1855, a civil war had broken out between the so-called "conservatives" and "liberals," which resulted in the victory of the latter, who were, however, obliged to call in the help of the since notorious col. William Walker (see FILLIBUSTERS).

By the constitution of Aug. 19, 1858, the republic of Nicaragua is governed by a president, who is elected by universal suffrage, and holds office for four years. There are two legislative chambers—the senate and the house of representatives. Liberty of speech and of the press exists, but is not absolutely guaranteed. The Roman Catholic religion, however, is the only one *publicly* tolerated, but the services of other religious bodies may be privately performed.

NICARA'GUA, LAKE (native, *Cocibolea*), a sheet of fresh water in the republic of the same name, 110 m. long, and from 30 to 50 broad. Its elevation above the Pacific, from which it is separated by a low range of hills—at one point only 48 ft. higher than the lake itself—is little more than 100 feet. The principal rivers flowing into it are the Mayales and Malacoloja on the n. and the Frio on the s.; the only one flowing out is the San Juan (formerly *Usaguadero*), which unites it with the Carribean sea. Its islands are numerous, lying mostly in groups; the principal are Ometepec, Zapatero (uninhabited, but with extensive ruins and monolithic idols), Salentanami, and the Corales. It has at last been determined to cut an interoceanic ship-canal through the state of Nicaragua, the route being by way of the San Juan river and lake Nicaragua. The whole distance by this route from ocean to ocean is 180½ m.; and, full advantage being taken of lake and river, 61½ m. of the total length will fall to the share of the new canal.

NICARA'GUA, or RI'VAS, a t. of the republic of Nicaragua (q.v.), Central America, on the western shore of the lake Nicaragua (q.v.), 35 m. s.s.e. from Granada. It is not a place of much commerce, the commerce of the lake being chiefly carried on by Granada. Pop. 8,500.

NICARA'GUA SHIP-CANAL. See INTEROCEANIC SHIP-CANAL.

NICASTRO, a t. of s. Italy, in the province of Calabria, is most beautifully situated w. of the Apennines, on the margin of the coast plains, and commanding views of the sea, 24 m. s. of Cosenza. It is the see of an archbishop. There are hot springs in the vicinity. Pop. stated at 7,000 and 10,200.

NICCOLA PISANO, a distinguished sculptor of Pisa, to the influence of whose works the rise or restoration of sculpture in connection with Gothic architecture is mainly attributable. There is no record of the date of his birth, but from an inscription on a celebrated fountain in Perugia, designed by him and executed by his son Giovanni, it is evident that he was born at the beginning of the 13th century. His earliest work is supposed to be the "Deposition," over one of the doors of the façade of the cathedral at Lucca, dated 1233. He worked on the principle of studying nature, modified or corrected by the ideal of antique sculpture; and it is said that he first adopted this principle from the sculpture on an ancient sarcophagus brought from Greece in the ships of Pisa;

but though most of the finest specimens of Greek sculpture were not discovered till long after Niccola's time, he must have had an opportunity of studying many important remains on the various classic ruins with which Italy abounds. This sculptor's reputation is supported by three important works, which remain and are still admired for their excellence—the pulpit of the baptistery at Pisa, the "arca" or shrine of St. Dominic for the church of that saint at Bologna, and the pulpit of the cathedral at Siena. The first of these was finished in 1260, and is reckoned the most elegant pulpit in Italy. It is of white marble, six-sided, supported by seven Corinthian columns, and adorned with five bas-reliefs of subjects from the New Testament. The second work, the "arca" of St. Dominic, is one of even greater extent. It is composed of six large bas-reliefs, delineating the six principal events in the legend of St. Dominic, and is ornamented with statues of our Savior, the virgin, and the four doctors of the church. The operculum or lid was added about 200 years afterwards. The subjects on the pulpit at Siena, the third of these works, are the same as those on that at Pisa, with the substitution of the "Flight into Egypt" and the "Massacre of the Innocents" for the "Presentation"; and the enlargement of the concluding composition, the "Last Judgment." In these compositions there is great felicity of invention and grouping, truth of expression, and grace in the attitudes and draperies; and in that of the "Last Judgment" the boldness displayed in the naked figures, twisted and contorted into every imaginable attitude, is wonderful, and evinces the skill with which Niccola drew on the antique and on nature. But it must be admitted that there is a degree of confusion or overfullness in the grouping, and that the heads of his figures are often large in proportion to the bodies; faults incidental to all early efforts. In this last work it appears by the contract for its execution that Niccola was assisted by his scholars Lapo and Arnolfo, and his son Giovanni; and this accounts for a certain feebleness that may be observed in portions of it. He died at Pisa in 1276 or 1277, and was buried in the Campo Santo. Niccola's influence on art extended widely; his pupils Arnolfo and Lapo executed numerous works at Rome, Siena, and other cities. His son and heir in reputation, though not his equal in talent, Giovanni Pisano, was constantly engaged on works of importance; in Pisa, where the Campo Santo (for he was also an architect) was erected from his designs; in Naples, which he visited on the invitation of Charles I. of Anjou; at Arezzo, where he executed the marble shrine of St. Donato for the cathedral; at Orvieto, the bas-reliefs on the *facerata* of the Duomo, by many ascribed to Niccola, being by him; at Pistoja, where he executed the pulpit, etc. The year of his death is not ascertained; it was probably about 1320. After Giovanni's death the Pisan school split into two principal branches, Florence and Siena; that of Naples may also be reckoned a branch, from the influence exercised over it by Giovanni.—ANDREA PISANO, the ablest of Giovanni's pupils, was called to Florence to execute in marble the statues, bas-reliefs, etc., designed by Giotto in ornamenting the cathedral of S. Maria del Fiore, then in course of erection. The talent he displayed soon raised him to a high position and important employment. He executed numerous statues for the façade of the cathedral, and a bronze gate for the baptistery, of very great excellence. This gate still exists, along with the later and still more celebrated gates of Ghiberti. Under the influence of Giotto's genius he became completely Giottesque in thought and style; and his works bear so distinctly the impress of that master-mind that the design of many of them, and particularly the baptistery gate, are ascribed to Giotto. He died in 1345, aged 76. See Vasari; *Christian Art*, by lord Lindsay; Agincourt, *Davia Memorie Istoriche;* Rosini, *Storia, etc.;* Cicognara (tom. i.), *Monumenti Sepolcrali della Toscana.*

NICCOLINI, GIOVANNI BATISTA, a distinguished modern poet, was b. in 1785, in the vicinity of Pisa, of a noble but impoverished family. Niccolini's first literary efforts were full of high promise of the classical and antique beauties which characterize his finest compositions, and in 1810 he was crowned by the Crusca academy. Through the influence of the queen of Etruria he was appointed secretary of the academy of fine arts, where he delivered to the young artists lectures on history and mythology; but on the fall of the Bonaparte sovereigns this post was withdrawn from the poet. In 1805 the grand duke Ferdinand appointed him librarian in the Pitti palace, an office he resigned in order to escape the servility of court dependence. By the death of a relative he acquired wealth and the power of exclusively devoting himself to literature, and published several much-admired essays and lectures; and in 1827 appeared his noble work *Antonio Foscarini.* In 1844 Niccolini published anonymously his best poem—*Arnoldo da Brescia*—and nothing finer has been written in modern Italian, whether it be viewed as a classical creation, full of life and poetry, or as a work of glowing patriotism. Niccolini lived in the enjoyment of fame and honors to a ripe old age, and died at Florence in 1861.

NICE, or NICÆA, formerly a city of Bithynia, in Asia Minor, situated on the eastern shore of lake Ascania. It was built, or rather rebuilt (for an olden town had existed on its site), by Antigonus, the son of Philip (316 B.C.), and received the name of Antigoneia, which Lysimachus changed to Nicæa, in honor of his wife. It was a handsome town, and of great importance in the time of the Roman and Byzantine emperors; all the streets crossed each other at right angles, and from a magnificent monument in the center the four gates of the city were visible. It is famous in ecclesiastical history for two councils held in it—the first and seventh ecumenical councils. The FIRST COUNCIL of Nice was held 325 A.D., and was convened by the emperor Constantine, in concert, according to Roman Catholic historians, with the Roman pontiff, for the purpose of defining the questions raised in the Arian (q.v.) controversy. The details of the proceedings, so far as regards Arius, will be found in that article. The supporters of Arius at first are said to have numbered upwards of twenty; but ultimately the decree condemning him was subscribed by the whole body of the council, the number of dissentients being, according to the highest computation, only five, while the most probable account reduces it to two. The NICENE CREED adopted in this council forms the subject of a separate article. In addition to the Arian question the council of Nice also deliberated on a schism, called the Meletian schism, which at that time divided the church of Egypt, and the particulars of which have formed a subject of recent controversy. The decree of Nice appears to have been founded on a compromise, but did not effectually suppress the schism. The decree of Nice on the celebration of Easter was of wider application, and met with universal acceptance, the few recusants being thenceforward called quartodecimans (q.v.). This council also enacted twenty canons of discipline. For a minute and picturesque description of this council see Dean Stanley's *History of the Eastern Church*..—The SECOND COUNCIL OF NICE, called also the seventh ecumenical council, was assembled under the empress Irene (787), who was regent during the minority of her son Constantine, for the purpose of reconsidering the subject of images. The tenor of the decree on images is detailed under that head. In the west the question of the acceptation of this council was the subject of considerable controversy, arising, in great measure, from a grossly erroneous Latin translation of the acts, which for a time obtained extensive circulation.

NICE (Ital. *Nizza*), chief town, since 1860, of the department of the Alpes Maritimes, France, is situated on both sides of the river Paglione, 100 m. s.s.w. of Turin, and about the same distance e.n.e. of Marseilles. Pop. '72, 42,363; '76, 46,683. It consists of three principal parts—the *Quartier de la Croix de Marbre*, or *New Town* (on the right bank of the Paglione), the *Old Town*, and the *Port*. The first of these is much frequented by foreigners, particularly English (whence its name of "English town"). It is close upon the river, has a handsome quay filled with gay shops, and a splendid square called the Jardin public. Two bridges over the Paglione connect it with the old or upper town, which extends back to the foot of a hill called the Castle hill. The old town is excessively dirty, and has narrow, stinking streets, with macaroni and confectionery shops, grocery establishments, slaughter-houses, etc. The port, almost separated from it by the Castle hill, is crowded with a seafaring population. The harbor admits vessels drawing 15 ft. of water, but it is difficult of entrance. The Castle hill, an isolated mass of limestone 800 ft. high, receiving its name from having been crowned by a strong castle, now in ruins, is laid out in public gardens, and affords an extensive and splendid prospect out to sea. The chief public buildings are in the Corso, or in the adjoining streets, in one of which there is an English library and reading-room. There is an Episcopalian, and also a Presbyterian church in Nice, and an English cemetery. The most attractive promenade in the old town is the *Terrace*, from 15 to 20 ft. high, erected as a protection to the town against a stormy sea. But the most agreeable and fashionable drive and promenade is the *Promenade des Anglais*, extending for a mile along the shore from the right bank of the Paglione, and skirted on one side by elegant villas and hotels. Beggars are numerous, owing, doubtless, to the great influx of visitors. Fine as the usual winter and spring weather of Nice is, it is exposed to the n. winds, or *mistral*, which during these seasons often brings a temperature which in England would be considered cool, or even cold, in April or October. The *Quartier Carabacel* is the most sheltered part of the place, and therefore the best for an invalid. Dust and bad drainage are the drawbacks to the amenity of Nice; but this is true with regard to most of the places of winter resort in the south. The mean January and February temperature is 47°, equal to that of April in England; March is 52°; April 58°, about the same as June in England, or July in Scotland.

The ancient Ligurian town of Nicæa, founded, it is said, by a colony of Phocæans from Massalia (Marseilles), became subject to Rome in the 2d c. B.C. It probably occupied the Castle hill, rather than the site of the present city. Subsequently it passed into the hands of the Goths, Burgundians, Visigoths, kings and counts of Arles, the Angevine sovereigns of Naples, and the dukes of Savoy (1388), in whose family it remained till 1860, when it was ceded to France.

NICE, COUNCILS OF, the first of which, held 325 A.D., is properly called ecumenical. It was convened by the emperor Constantine who, with the invitation sent to each bishop, provided public conveyance for himself, two presbyters, and three servants. The empire had at the time about 1800 bishops, 1000 of whom were in the Greek provinces, and 800 in the Latin. Of these, according to the statement of Athanasius, 318 attended the council, of which only 1 was from the Latin church. The total number of delegates, including presbyters and others, was probably more than 1500. The eastern provinces were largely represented. Many of the members were venerable and illustrious men, among whom were Eusebius, eminent for learning; Athanasius, then only a young deacon, attendant on the bishop of Alexandria, small and insignificant in person, but conspicuous for intellect, eloquence, and zeal; Arius, a parish-priest of Alexandria, 60 years old, tall and emaciated in person, wild, sometimes almost to madness, in manner ascetic, and negligent in dress, yet having a sweet voice, and fascinating speech; Potamon of Herakles; and Paphnutius, of the upper Thebaid, whose right eye had been dug out with a sword, and the empty socket seared with a hot iron; Paul of Neo-Cæsarea, also scarred by the brand of hot iron which had crippled both his hands; Jacob of Nisibis, who had spent years as a hermit in forests and caves, subsisting on plants and roots; Spiridion of Cyrus, continuing, even after his ordination, a literal shepherd; Hosius of Cordova, the ablest and best of the western delegates; two Roman presbyters, influential as representing Sylvester, the bishop of Rome, who was kept at home by the infirmities of age; a Persian bishop from the eastern frontier, and a Gothic bishop from the north. Constantine's object in convening the council, as announced in his opening address, was to heal the divisions in the church, the system of which, he said, had surprised and distressed him. There were two principal controversies then raging—one of them doctrinal, relating to the nature of Christ, and the other ritualistic, having reference to the time for the observance of Easter. At the opening of the discussions on the former there seemed little prospect that the emperor's prayer for harmony among the delegates would be answered. Accusations and recriminations were banded to and fro without regard to his presence. He was unmoved amid the angry voices, turning from one side of the hall to the other, giving attention to the questions proposed, and bringing together the angry partisans. Laying aside his stately Latin he addressed them in broken Greek, praising some, persuading others, shaming a third class, and directing all his energies to the one point of securing unanimity of decision. The first sessions were devoted chiefly to a discussion of the Arian views, accompanied with an examination of Arius himself. He maintained that the Son of God was a creature, though indeed the most exalted of all; that he had been made out of nothing; that there was a time when he did not exist; and that, in his own free will, he was capable of right and wrong. The songs which he had written to popularize his opinions were sung in the council; and, apparently by himself, dancing like an eastern dervish while he uttered their wild, abstract statements in long straggling lines. The first attempt to reach a decision was made by producing an ancient creed of Palestine, the basis of that which was ultimately adopted, but opposed at first by the orthodox—the more violently, because the Arians were willing to adopt it. A letter having been read from Eusebius of Nicomedia, in which he declared that to assert the Son to be uncreated would be to say that he was of one substance (ὁμοοῦσιος with the Father; the expression was laid hold of as furnishing the very test for which they were seeking. The creed, as finally adopted, was as follows: "We believe in one God, the Father, Almighty, Maker of all things, both visible and invisible; and in one Lord, Jesus Christ, the Son of God, begotten of the Father; only begotten—that is to say—of the substance of the Father; God of God, Light of light, very God of very God: begotten—not made—being of one substance with the Father; by whom all things were made, both things in heaven, and things in earth; who for us men, and for our salvation, came down and was made flesh, and was made man; suffered, and rose again on the third day; went up into the heavens; and is to come again to judge the quick, and the dead; and in the Holy Ghost." But those that say "there was when He was not," and "before He was begotten He was not;" and that "He came into existence from what was not;" or who profess that the Son of God is a different person or substance; or that he is created, or changeable, or variable, are anathematized by the Catholic church. The second controversy determined at the first council of Nice had reference to the time for observing Easter, and was the most ancient in the church. Its name—the "quartodeciman"—or, fourteenth-day controversy, was derived from the Jewish rather than the Christian calendar. The question in dispute was, Ought the Christian passover to be celebrated on the same day as the Jewish—the 14th day of the month Nisan—or on the following Sunday? This fundamental question became entangled with others relating to the fast of 40 days, and to the changes in the vernal equinox. On the one side were the apostolic traditions, and on the other the new Catholic spirit seeking separation from Jewish ideas. At the date of the council the Judaic time was observed by the principal eastern churches; and the Christian time by the western churches, with a part of the eastern. The decision was in favor of the Christian time; not as a matter of doctrine to be received under penalty of anathema, but as determined by common consent on the principle that the will of the majority should prevail. Some smaller matters also were decided by the council, and 20 canons passed on various subjects pertaining to morality and religion. II. The second council of Nice, incorrectly called the seventh ecumenical, convened first in 786 by the empress Irene and her son Constantine, was dissolved, because of the tumults raised by the image-breaking party, and reassembled the following year. Three hundred and seventy-five bishops attended from Greece, Thrace, the isles of the Archipelago, Sicily, and Italy. The council was occasioned by the emperor's ill-judged severity in forbidding the use of images for any purpose, and causing them everywhere to be removed and destroyed; and by the violent opposition to his course. At a council assembled 754, in Constantinople, consisting of 338 bishops, a decree was published against the use of images. To revoke this decree was the object for which Irene summoned the second council of Nice. At the fifth session this object was accomplished by the passage of an order that images should be restored to their places, and carried in procession as before. At the next session it was affirmed that the eucharist is nowhere spoken of as the *image* of our Lord's body, but as the very body itself. At the seventh session it was decided that images ought to be exposed to view in order to excite love toward the objects represented by them, and that salutation and adoration of honor ought to be paid to them, but not the worship which belongs to God alone. For a long time this council was not recognized by the French. Their chief objections to it, as contained in the Caroline books, written by order of Charlemagne, were: 1. That no western bishops, except the pope, by his legatees, were present. 2. That the decision was contrary to their custom, which was to use images, but not in any way to worship them. 3. That the council was not assembled from all parts of the church; nor was its decision in accordance with that of the Catholic church. These objections were answered by pope Adrian, but with little effect on the Gallican church.

NICENE CREED, a detailed statement of doctrine, which forms part of the liturgy of the Roman, Oriental, and Anglican churches, and is also received as a formulary by many of the other Protestant communions. It was drawn up principally by Hosius of Corduba, and is called by the name of the council of Nice, although nearly one-half of its present clauses formed no part of the original Nicene formulary; while, on the other hand, that document contained a series of anathemas condemnatory of specific statements of Arius, which find no place in the present so-called Nicene creed. The distinctive characteristic of the creed drawn up in the council was the word *Homoousios*. (See HOMOOUSIAN.) Its clauses correspond (except in a few verbal details) with those of the modern formulary as far as the words "I believe in the Holy Ghost;" after which follow the anathemas referred to above. The remaining clauses of the present creed, although they seem to have been in public use earlier, were formally added in the first council of Constantinople (381), with the exception of the clause, "And from the Son," which was introduced in various churches of the west in the 5th and 6th centuries; and ultimately its formal embodiment in the creed, has continued a subject of controversy with the Greeks to the present day. See GREEK CHURCH. This creed appears to have been used in the public liturgy from the latter part of the 5th century. Its position in the lithurgy varies in the different rites. In the Roman liturgy it is read on all Sundays, feasts of our Lord, of the blessed Virgin Mary, apostles' days, and all the principal festivals, but not on week-days, or the minor saints' days.

Several Arian creeds, in opposition to that of Nice, were drawn up at Sirmium and elsewhere (see LIBERIUS), but none of them met with general acceptance.

NICEPHORUS, patriarch of Constantinople, 758–828; b. Constantinople. He was the son of Theodore, imperial secretary of Constantius Copronymus. He first held high office at court. In 787 he was present as imperial commissioner at the Nicene council, where, in defense of image-worship, he opposed the iconoclasts. This zeal for image-worship he inherited from his father. Soon after his return to the capital he retired to a convent, whence, in 1863, he was called to be patriarch of Constantinople. Leo the Armenian, who became emperor in 818, passed an edict in 814 against the worship of images. But neither menaces nor entreaties could induce Nicephorus to assent to it. He became unpopular at court, and in the ensuing year was deposed, and withdrew to the convent of St. Theodore, which he himself had founded, and remained there till his death. He is sometimes called *Homologeta*, or *Confessor*, because of his vigorous opposition to the Iconoclasts, and his subsequent deposition. He published several valuable ecclesiastical works, characterized by great beauty of style. His historical productions are distinguished for accuracy, discernment, and erudition. The most important are *Breviarium Historicum*, a historical abridgement, published with a Latin translation and notes by father Petran, in Paris, in 1616; and M. Cousins has given a French translation of it in his *History of Constantinople; Chronographia Brevis*, a short chronicle of events from the beginning of the world to the author's time, with the series of kings, emperors, patriarchs, bishops, etc. It was translated into Latin, and published with notes, by father Goar, Paris. Niuphorus is numbered among the saints in both the Greek and Roman churches.

NICHE, a recess formed in a wall to contain a statue or some ornamental figure. In classical architecture, the niches are generally square recesses with canopies formed by small pediments. In Gothic architecture, the niche is one of the most frequent and characteristic features; the door-ways, buttresses, and every part of the buildings being in many instances ornamented with niches and statues in endless variety.

NICHIREN, b. at Kominato, province of Awa, Japan, 1222; the founder of one of the largest, wealthiest, and most influential sects of Japanese Buddhists, and the great revivalist of Buddhism in the 13th century. He became a profound student of those Chinese and Sanscrit texts containing the writings of Buddha's first apostles, whose richness and genuineness prof. Max Müller has recently acknowledged. After many years spent in preaching, founding temples, and making missionary tours, he died at Ikegami, near Tokio. He was several times exiled, wrote several works, still extant, and probably did more than any other man to bring all Japan under the tenets of Buddhism. His place of decease is visited annually by thousands of pilgrims, who come on foot or by railway. The Nichirenites are the "ranters" of Buddhism; and probably the grossest form of the modern degenerate religion of Buddha, finds its expression, among an outward show of great intellectual ability, among the disciples of Nichiren.

NICHOL, JOHN, LL.D., b. Scotland, 1833; only son of prof. John P. Nichol, late professor of astronomy; received an education at the university of Glasgow, 1848–55. In the latter year he went to Balliol college, Oxford, where he pursued his studies until 1859; and in 1861 he was appointed professor of English literature in the university of Glasgow. In 1873 the degree of LL.D. was conferred upon him by the ministry of St. Andrews. He has been a successful tutor, having directed the studies of 150 candidates for Oxford; and is popular as a lecturer, having given more than 200 addresses on miscellaneous subjects, and to classes of ladies in special branches of study, in various parts of Great Britain. During the war of the rebellion he espoused the union cause, and, as well by its advocacy as by his Broad church doctrines, made himself a mark for hostile comment in Scotland, and thereby gained much honorable notoriety. He has contributed to the *Westminster*, *North British*, and other reviews, a number of valuable essays. He is one of the writers on the *Encyclopædia Brittanica;* in 1860 he published *Fragments of Criticism*, a volume of essays; and in 1872, *Hannibal*, a classical drama.

NICHOL, JOHN PRINGLE, 1804–59; b. Scotland; at first a school-teacher, then a minister. His fondness for scientific studies led him to give up the ministry, and he became a popular lecturer and writer on astronomy. Among his numerous works on this subject may be mentioned *The Architecture of Heaven* (1838); *Contemplations on the Solar System* (1844); *Exposition and History of the Planet Neptune* (1848); *The Stellar Universe* (1848); *The Planetary System, its Order and Physical Structure* (1851). He published also *A Cyclopædia of the Physical Sciences* (1857). He was professor of practical astronomy at the university of Glasgow.

NICHOLAS, a co. in n.e. Kentucky, intersected by the Kentucky Central railroad; 225 sq.m.; pop. '80, 11,869—11,679 of American birth, 1750 colored. It is drained by Licking river, forming its n.e. boundary, and the South Fork as its s.w. border. Its surface is undulating, rising in the n. into considerable elevations. Blue Lick spring is celebrated for its medicinal qualities. The soil is calcareous and very fertile, producing every variety of grain, dairy products, tobacco, wool, and sorghum. It has distilleries and manufactories of flour, and lumber. Co. seat, Carlisle.

NICHOLAS, a co. in central W. Va., intersected centrally by the Ganley river forming a part of its w. boundary; about 700 sq.m.; pop. '80, 7,223—7,155 of American birth, 58 colored. It is drained by Meadow river and Buffalo creek, also Birch river in the n.e. and numerous riverlets. Its surface is diversified, much of it rising into high hills, in the n.e. is Birch mountain. Its soil is moderately fertile, producing corn, oats, wool, dairy products, and sorghum. Live stock is raised. A large proportion of the surface is covered with forests, and coal and iron are found. Co. seat, Nicholas Court House.

NICHOLAS, the name of five among the Roman pontiffs, of whom the following alone appear to call for separate notice.—Nicholas I. was born of a noble Roman family, and on the death of Benedict III., in 858, Nicholas was elected to succeed him, and was consecrated in St. Peter's church, in the presence of Ludwig II., emperor of Germany. The earliest incident of importance of his pontificate is his conflict with Photius (q.v.), who had been intruded into the see of Constantinople after the deprivation of Ignatius. Nicholas demanded from the emperor the restoration of Ignatius, as well as the withdrawal of certain attempted invasions of the jurisdiction of the west. On the refusal of his demand, Nicholas excommunicated Photius (see GREEK CHURCH), and that patriarch, in return, assembled a council at Constantinople, and retorting upon his rival the same sentence, alleged that with the translation of the seat of civil sovereignty from Rome to Constantinople the ecclesiastical supremacy was likewise transferred. The emperor Michael supporting Photius in his claim, Nicholas failed to command submission to his sentence; nor was it till the following reign, that of Basil the Macedonian, that Photius was deposed, and Ignatius restored to his see. Meanwhile, however, Nicholas had been embroiled with the emperor Ludvig. The pope had been appealed to by the unjustly divorced wife of Ludvig's younger brother, Lothaire, king of Lorraine, and had appointed legates to inquire into and report upon the case; and the legates having exceeded their powers by giving a sentence in favor of Lothaire, the pope declared their sentence null, and excommunicated them. Ludvig espoused their cause, and marched his troops to Rome, in order to enforce satisfaction. After some hostile demonstrations, the emperor, terrified, it is said, by his own sudden illness and some fatalities which befell his followers, desisted from the enterprise, and withdrew his troops. Lothaire was forced to make submission; the decree of Nicholas was enforced, and Theutberga was formally reinstated in her position as a wife and queen. Nicholas died in 868.—NICHOLAS V. was originally called Thomas Parentucelli. Born at Pisa in 1398, he was educated at Florence and Bologna, and having fixed his residence in the latter city, he was eventually named bishop of that see by the pope, Eugenius IV. During the troubled period of the councils of Basel and Florence, and in the difficult negotiations with the German and other churches which arose therefrom, he conducted himself with such ability and prudence, that on the death of Eugenius IV. he was chosen to succeed him on Mar. 6, 1447. At this time, the anti-pope, Felix V., still maintained himself, although supported by a very small party; but Nicholas prevailed on him to abdicate, and thus restored the peace of the church in 1449. In the judgment of the literary world, however, the great distinction of the pontificate of Nicholas lies in the eminent service which he rendered to that revival of letters which dates from his age. The comparative repose in which he found the world at his accession, enabled him to employ, for the discovery and collection of the scattered master-pieces of ancient learning, measures which were practically beyond the resources of his predecessors. He dispatched agents to all the great centers, both of the e. and the w. to purchase or to copy every important Greek and Latin manuscript. The number collected by him was about 5,000. He enlarged and improved the Roman university. He remodelled, and may almost be said to have founded, the Vatican library. He caused translations to be made into Latin of most of the important Greek classics, sacred and profane. He invited to Rome the most eminent scholars of the world, and extended his especial patronage to those Greeks whom the troubles of the native country drove to seek a new home in the west. Alarmed by the progress of the Turkish arms in Asia, he endeavored to arouse the Christian princes of Europe to the duty of succoring their brethren of the e.; but the age of enthusiasm was past, and he was forced to look on inactively at the fall of Constantinople in 1453. This event, by forcing a large number of learned Greeks to repair to Italy and other countries of the w., contributed powerfully to that progress of learning which Nicholas had deeply at heart; but he scarcely lived to enjoy this result, having died two years later, in 1455, at the comparatively early age of 57. He must not be confounded with an anti-pope of the same name, Peter de Carborio, who was set up, in 1328, by Ludvig of Bavaria, in antagonism to John XXII. (q.v.).

NICHOLAS, Saint, a highly popular saint of the Roman Catholic church, and reverenced with still greater devotion by the Russian church, which regards him as a special patron, was one of the early bishops of Myra in Lycia. The precise date of his episcopate is a subject of much controversy. According to the popular account he was a confessor of the faith in the last persecution under Maximinian, and having survived until the council of Nice, was one of the bishops who took part in that great assembly. This, however, seems highly improbable. His name does not occur among the signatures to the decrees, nor is he mentioned along with the other distinguished confessors of the faith who were present at the council, either by the historians, or what is more important, by St. Athanasius. He may, with more probability, be referred to a later period; but he certainly lived prior to the reign of Justinian, in whose time several of the churches of Constantinople were dedicated to St. Nicholas. Of his personal history hardly anything is certainly known, and the great popularity of the devotion to him rests mainly on the traditions, both in the w. and in the e., of the many miracles wrought through his intercession. He is regarded, in Catholic countries, as the especial patron of the young, and particularly of scholars. In England, his feast was celebrated in ancient times with great solemnity in the public schools, Eton, Sarum cathedral, and elsewhere; and a curious practice founded upon this characteristic of St. Nicholas, still subsists in some countries, especially in Germany. On the vigil of his feast, which is held on Dec. 6, a person in the appearance and costume of a bishop assembles the children of a family or of a school, and distributes among them, to the good children, gilt nuts, sweetmeats, and other little presents, as the reward of good conduct; to the naughty ones, the redoubtable punishment of the "Klaubauf." The supposed relics of St. Nicholas were conveyed from the e. to Bari, in the kingdom of Naples, towards the close of the 11th c.; and it is a curious fact that in the Russian church the anniversary of this translation, May 8, is still observed as a festival.

NICHOLAS, Saint (*ante*), regarded also as the patron saint of sailors, of parish clerks, and of thieves or "knights of S. Nicholas." From the nearness in time of the saint's festal day to that of the Nativity, St. Nicholas became connected with the legends and festivities of Christmas week, and synonymous or nearly so with Santa Claus and the Dutch Kriss Kringle. By the Dutch settlers of New York St. Nicholas was regarded with special favor, and to this day his festival is annually observed with great hilarity by the St. Nicholas society of Manhattan island. *The Visit from St. Nicholas* is the title of Dr. Moore's well known song, beginning: "'Twas the night before Christmas, and all through the house, etc." In art St. Nicholas is represented as clad in episcopal robes and carrying three purses, three golden balls, or three children, referring to three different stories illustrating the saint's charity.

NICHOLAS I., more properly Nikolai Paulovitch, emperor of Russia, was the third son of Paul I., and was b. at St. Petersburg, July 7, 1796. He was very carefully educated under the eye of his mother, a princess of Würtemberg, and subsequently devoted his attention to military studies and political economy, without, however, giving evidence of any natural capacity for these subjects. He visited England and other European countries in 1816, and in the same year made a tour through the Russian provinces. On July 13, 1817, he married Frederika-Louisa-Charlotte-Wilhelmina, the eldest daughter of Frederic William III. of Prussia, and lived in domestic retirement till the death of Alexander I. (December 1825), when, owing to the resignation of his elder brother Constantine, he succeeded to the throne of Russia. A long-prepared military conspiracy broke out immediately after his accession, which he suppressed with great vigor and cruelty. Capital punishment, which had been abolished by the empress Elizabeth, was revived, for the purpose of inflicting it upon the leaders of the insurrection. The rebels were hunted down with merciless energy, and in no case, even after the rebellion ceased to be in the least degree dangerous, was their punishment commuted. Instead of pursuing the course upon which Alexander had entered—cultivating the mind of the nation, so as to base his government upon education and intelligence—Nicholas, after a brief ebullition of reformatory zeal, reverted to the ancient policy of the czars, absolute despotism, supported by mere military power. His first great measure, the codification of Russian law, was commenced in 1827, and completed in 1846.

Soon after his accession, a war with Persia commenced, but it was concluded on Feb. 28, 1828, by the peace of Turkmanshai, which gave a considerable extent of territory to Russia. In the same year he entered upon a war with Turkey, in which victory, though at enormous cost, constantly attended his arms, and the peace of Adrianople (q. v.) obtained for Russia another increase of territory, the free navigation of the Danube, with the right of the free passage between the Black and Mediterranean seas. The political movements of 1830, in the west of Europe, were followed by a national rising of the Poles, which was suppressed after a desolating contest of nine months, in which the utmost efforts of the whole military resources of Russia were required. Nicholas punished the rebellion by converting the kingdom of Poland into a mere Russian province, and strove to extinguish the Polish nationality. This policy, however, was viewed with great dissatisfaction throughout Europe, and the vanquished Poles were everywhere regarded with general sympathy. Russia, by Nicholas's mode of government, became more and more separated from the fellowship of the western nations. Intellectual activity was, as far as possible, restrained to things merely practical, education limited to preparation for the public service, the press was placed under the strictest censorship, and every means used to bring the whole mind of the nation under official guidance. His Panslavism (q. v.) also prompted him to Russianize as much as possible all the inhabitants of the empire, and to convert Roman Catholics and Protestants to the Russian Greek Church, of which the Czar is the head. The independence of the mountaineers of the Caucasus was inconsistent with his schemes, and war was consequently waged against them with the greatest energy and perseverance, although with little success, and at the cost of immense sacrifices both of money and lives. The extension of British influence in Central Asia was also viewed by him with alarm, and was attempted to be counteracted by various means, amongst which was the expedition for the conquest of Khiva in 1839, which failed so signally (see KHIVA). Between 1844–46, he visited England, Austria, and Italy. During the political storm of 1848–49 he abstained from interference, watching, however, for an opportunity of doing so with advantage to Russian interests. The opportunity was at last found in the request of the emperor of Austria for his assistance to quell the Hungarian insurrection. This good service rendered Austria, as he thought, a faithful and firm ally. He succeeded at the same time in drawing closer the bonds of alliance between the Russian and Prussian monarchies, a proceeding fraught with the most mischievous consequences to the latter power. The re-establishment of the French empire still further tended to confirm these alliances, and led Nicholas to think that the time had at length come for carrying into effect the hereditary Russian scheme for the absorption of Turkey; but the unexpected opposition of Britain and France, and his own invincible repugnance to give up his long-planned scheme of conquest, brought on the Crimean war, during the course of which he died at St. Petersburg, Mar. 2, 1855, of atrophy of the lungs; but his death was undoubtedly hastened by chagrin at the repeated defeats which his arms sustained, and by over-anxiety, and the excessive labor he underwent to repair his losses. He was remarkable for temperance, frugality, and patriotism, but equally so for vanity and ostentation. He was fanatically beloved by his Russian subjects, and was at the same time regarded by them with feelings of awe, a tribute to his lofty stature and imperial deportment, which gave him the most intense pleasure. This extreme vanity seems, to some extent, to have affected his mind, and to have been partly the cause of his political blundering towards the close of his reign.

NICHOLAS I., Prince of Montenegro, b. 1841; educated in Cettigue, Trieste, and at the Paris military academy, returning to Cettigue when about 20 years old. In 1860 occurred the assassination of prince Danilo the uncle of Nicholas, who was immediately proclaimed prince; and the same year married the daughter of the waywode Peter Valsetitch, by whom he has an heir, Danilo Alexander, now ten years old, and several daughters. In the first part of his reign he traveled extensively, visiting all the European countries. He introduced many reforms in education, civil administrations, and army organization. On Jan. 19, 1878, the subjects of prince Nicholas captured Dulcigno and by the Berlin treaty of the same year, Montenegro was recognized as an independent power, the sovereignty up to that time having been claimed by the Porte. Various districts of Herzegovina and Albania were ceded to Montenegro by the same treaty. In the complications which followed both with the Albanians and with the port, Nicholas showed much political sagacity, but in the seizure of Gusinje (Oct. 1879,) his reign was disgraced by pillage and slaughter of women and children. Up to the present time the cession has not been fully carried out, though much pressure has been exercised by the other powers.

NICHOLAS, Grand Duke of Russia, b. Russia, 1831; son of Nicholas I, and brother of the late emperor, Alexander II. He entered the military service in 1847, spent a few days at Sebastopol in 1855, during the siege, and was for two years on the staff of the army in the Caucasus, where he took part in several skirmishes against the seven cherkesses. He was soon made general, and inspector-general of engineers, and commander-in-chief of the army. In the Russo-Turkish war, he was commander-in-chief of the army of the Danube, which invaded Roumania in April, 1877; he resigned in April, 1878, and was succeeded by gen. Todleben. He married, in 1856, princess Alexandra of Oldenburg, by whom he has two sons.

NICHOLAS, George, d. 1799, b. Va., son of Robert Carter, Nicholas chancery judge of Virginia, graduated in 1772 from William and Mary college, Williamsburg, Va. In the revolutionary war he was major of the 2d Va. regiment in 1777, and afterward held the rank of colonel. He was distinguished for bravery in the field, and wisdom in council, and had high reputation as statesman, and jurist. He was a member of the convention which made valid the federal constitution, and wielded a powerful influence in the house of delegates. In 1790 he removed to Kentucky, was the first attorney general of that state, and one of the original framers of its constitution April 1, 1792. He died in Lexington, Ky.

NICHOLAS, Wilson Cary, d. 1820, b. in Virginia, and was educated at William and Mary college. On the outbreak of the revolution he entered the army, became the commander of Washington's life-guard, and continued in that position until its disbandment in 1783. He was a member of the Virginia convention which ratified the U. S. constitution, was U. S. senator 1799—1805, and was elected to congress in 1807; previous to that time he was collector of the ports of Portsmouth and Norfolk. In 1814 he was elected governor of Virginia by the Jeffersonian democrats.

NICHOLS, Edward Tatnall, b. Geo., 1823; entered the navy midshipman in 1836, and was made lieutenant in 1850. He commanded the steamer *Winona*, in 1862, and took part in the bombardment of forts Jackson and St. Philip, the latter of which surrendered to him April 28. The following summer, he was at the passage of the Vicksburg batteries, and fought the confederate ram *Arkansas*. In 1863 he took command of the steamer *Alabama*, in the West India squadron, and in 1864 of the *Mendota* in the blockake squadron in the n. Atlantic, fighting a confederate battery on the James river in June. He was made captain in 1866, and commodore in 1872.

NICHOLS, Ichabod, 1784–1859, b. Portsmouth, N. H.; educated at Harvard. After graduating he studied theology at Salem and was for four years a tutor in mathematics at the university. In 1809 he became associate pastor of a Portland unitarian church; in 1814 became sole pastor and remained so for more than 40 years; and in 1855 removed to Cambridge, Mass. His published works are *Natural Theology*, 1830; *Remembered Words from the sermons of the Rev. J. Nichols*, 1860, and *Hours with the Evangelists*, 1861. His doctrinal views were of the evangelical type.

NICHOLS, John, 1745–1826, b. near London; apprenticed when a boy to Wm. Bowyer, the last of the learned printers. He rapidly rose in the favor of his master, in 1766 was taken into partnership, and on the death of Bowyer, about ten years later, was at the head of the business. For the next 40 years he devoted himself to writing and printing a very large number of works (said to have been 57 as early as 1812). These were occupied mainly with literary anecdotes and antiquarian research. His first book was *Biographical and Literary Anecdotes of William Bowyer, Printer, F.S.A.* (1782), afterwards expanded into six octave volumes and called *Literary Anecdotes of the Eighteenth Century*, and supplemented by seven large octavo volumes of the same character. In these books may be found a most extensive collection of literary and biographical anecdote and of correspondence of eminent men. From 1778 until the time of his death Mr. Nichols was editor of the *Gentleman's Magazine*, where his taste for minute biographical and topographical research found full scope. He was successful as publisher and printer, though he met the great misfortune of losing his office and warehouses by fire in 1808. At his death his son John Bowyer Nichols succeeded him in his business, and continued the series of *Literary Anecdotes of the Eighteenth Century* then being published. John Gough Nichols, b. 1807, was the son of John Bowyer Nichols; was for many years previous to 1856 the editor of the *Gentleman's Magazine*, and wrote many topographical and genealogical articles, among others *The Herald and Genealogist;* d. 1873.

NICHOLS, Richard, about 1620–80; b. in England; in 1664 was appointed one of four commissioners to look into complaints made in various parts of New England and to overpower the Dutch of Manhattan. The latter surrendered in the same year and Nichols was recognized as governor of New York and New Jersey. In 1667 he returned to England, resigning the administration of New York to col. Lovelace, and that of New Jersey to Carteret.

NICHOLS, William A., 1817–69, b. Penn., educated at West Point and after graduating in 1838 was commissioned in the 2d artillery. In the Mexican war he served as aid-de-camp to Gen. Quitman and was made brevet assistant adj.gen. in 1852 with rank of captain, for his gallant services at Monterey, Churubusco and Molino del Rey. At the outbreak of the civil war he was a lieut.col., was made col. in 1864, and brevetted brig.gen. in 1864 and maj.gen. in 1865. After the war he was made adj.gen. of the department of the Missouri.

NICHOLSON, Sir FRANCIS, d. 1728; b. England; lieut.gov. of New York under Andros 1687–89. He was governor of Virginia 1690–92, and again 1699–1705. He was governor of Maryland 1694–99; commanded the expedition against Port Royal in 1710, and the unsuccessful expedition against Canada in 1711. He was governor of Nova Scotia 1712–17, was knighted in 1720, and was governor of South Carolina 1721–25, when he was made lieut.general.

NICHOLSON, J. W. A., b. Mass. 1821; midshipman in the navy 1838–44; became passed midshipman, and in 1852 was raised to lieutenant. In 1853–55 he accompanied the Japan expedition in the sloop *Vandalia*. During the war of the rebellion he was in actions which required great coolness and bravery in a commander. He took part in the engagement at Aquia creek, a branch of the Potomac river near Fredericksburg, Virginia. He commanded the steamer *Isaac Smith*, of the South Atlantic blockade squadron, in the battle of Hilton Head at Port Royal, Beaufort, S. C., Nov. 7, 1861, when the naval, combined with the land forces under Gen. W. T. Sherman, captured forts Warren and Beauregard. In 1862 he was promoted to commander, and in the same year was in action with the confederate flotilla on the Savannah river. At the battle of Mobile bay Aug. 5, 1864, he commanded the monitor Manhattan, attached to the w. Gulf blockade squadron, under admiral Farragut, destroying and capturing the confederate fleet in a short sharp conflict resulting in the surrender of fort Gaines; he also engaged in the bombardment of fort Morgan. In 1865–66 he commanded the steamer *Mohongo* in the Pacific squadron, and was promoted to captain in 1866. In 1867–68 he commanded the Wampanoag, and was raised to the rank of commodore in 1873.

NICHOLSON, JAMES, 1737–1804, b. Md.; adopted a sea-faring life as did two of his brothers, who afterward rose to be captains in the navy, He participated in the capture of Havana in 1862, and in 1763 took up his residence in New York. In 1775 he was appointed captain of the *Defense*, in the American navy, and in 1776, he regained from the British several vessels which they had captured. The same year, he took command of the *Virginia*, carrying 26 guns, and the next year, he was appointed commander-in-chief of the navy, succeeding commodore Esek Hopkins, and remaining in that position till the close of the war. His vessel being prevented from going to sea by a strict blockade, he volunteered with his crew in the American army, and took part in the battle of Trenton. Soon afterward in putting out to sea, his ship ran aground and was taken, but he succeeded in escaping, an d most of the crew was saved. In 1780, in command of the *Trumbull* of 38 guns, he fought for 3 hours with the British ship *Wyoming*, losing 30 men; neither ship gained a decided advantage. In 1781, off the Delaware capes, after a stubborn resistance, he was captured by the *Iris* and *General Monk*. At the close of the war, he returned to New York city, where he was appointed commissioner of loans. He was the father-in-law of Albert Gallatin.

NICHOLSON, JOHN, British general, one of the most distinguished of the later school of Indian soldiers, was born in Dublin, Dec. 11, 1821. His father, a physician of considerable reputation in that city, died when the boy had just completed his 8th year. By his mother, a woman of strong sense and much practical piety, he was carefully educated; and from her he seems to have inherited or imbibed a certain religious gravity and earnestness of character which was early noted in him. and continued, to distinguish him through life. Through the influence of her brother, Sir James Weir Hogg, an Indian cadetship was obtained for him; at the age of 16, he arrived in Calcutta, and was soon after posted to the 21st native Bengal infantry, then stationed at Ferozepore. In 1840, his regiment was ordered to Ghizni in Afghanistan, where two years after, in the disastrous insurrection which avenged our occupation of the country, it was compelled to surrender to the enemy. After a time of miserable captivity, he regained his liberty, and joined the relieving army under gen. Pollock, to be saddened immediately after by the death, in action, of his brother Alexander. A period of inactivity ensued, during which he was stationed at Meerut, doing duty as adjt. of his regiment. On the breaking out of the Sikh war in 1845, he served in the campaign on the Sutlej, and was present at the battle of Ferozeshah, though, as attached to the commissariat department, without special opportunity of distinguishing himself. After the cessation of the war, through the recommendation of col. (afterwards sir Henry) Lawrence, Nicholson, now a lieut, was appointed assistant to the resident at the conquered capital, Lahore, and thus fairly transferred to the political branch of the service, in which most of his future time was passed. But shortly, with the outbreak of the Sikh rebellion in 1848, there came an interlude of military activity, in which he greatly distinguished himself. To Nicholson's daring and promptitude was due the preservation to us of the important fortress of Attock; and soon after, his success at the Margulla pass, in intercepting and defeating a large body of the insurgents, brought his name prominently before the world. Throughout the struggle which followed, he rendered important service; and at the great battles of Chillianwalla and Gujerat successively, he earned the special approval of lord Gough, to whom he was immediately attached.

The Punjab having finally become a British province, capt. Nicholson was appointed a deputy-commissioner under the Lahore board, of which sir Henry Lawrence was president. He had now been nearly ten years in India; his strength was somewhat shaken by arduous service, and various illnesses which from time to time had assailed him; and above all, he was anxious to visit and console his widowed mother, then prostrated by the death in India, by an accident, of William, his younger brother. In 1850, accordingly, he took his furlough, and returned home, taking Constantinople *en route*, and visiting, with an eye to professional instruction, the capitals of all the great military powers of the continent. On his return to India, he was again appointed by Lawrence a deputy-commissioner in the Punjab, and for five years subsequently his work lay among the savage tribes of the frontier. His success in bringing them under thorough subjection to law and order, was something marvellous; and such were the impressions of fear and reverence wrought by the force and massive personalty of the man, that he became among these rude populations, under the title of "Nikkul Seyn," the object of a curious kind of hero-worship. So far was this carried, that a sect actually arose, of Nikkul-Seynees, who consecrated him as their Guru (or spiritual guide), and persisted—despite of severe floggings regularly inflicted by the worthy man, indisposed to accept divine honors—in falling at his feet, and making him an object of express adoration.

With the outbreak of the great mutiny in 1857 came Nicholson's supreme opportunity, and the brief career of glorious achievements in which he developed in the eye of the world the full power and splendor of his military genius. In the saving of the Punjab, virtually India was saved to us; and under sir John Lawrence, who had succeded his brother, sir Henry, Nicholson—though not without noble coadjutors to divide with him the honor—perhaps did more than any other single man to hold firm our grasp of the Punjab. He it was who suggested the formation of the famous movable column, by which mainly the work was done, and presided over its organization. Shortly, he was appointed to command it; and in his dealings with the suspected regiments of sepoys, he exhibited a particular combination of boldness with subtlety, discretion, and astuteness, scarcely too much to be admired. At Trimmu Ghaut, on the 12th and 14th of July, he brought to bay, and nearly utterly annihilated, a large force of the declared rebels. Things thus made safe behind him, he marched to re-enforce the army of gen. Wilson, engaged in the siege of Delhi, arriving in camp on Aug. 7. His presence and counsels gave new impulse to the operations; and in every way he strove, with fiery and impatient energy, to expedite the delayed assault. A strong body of the enemy having tried to make their way into the British rear, to Nicholson was assigned the task of intercepting and bringing them to battle. This he achieved on Aug. 24, near Nujuffghur—under circumstances of extreme difficulty, in the most masterly manner surmounted—obtaining a most brilliant result in the complete ruin and dispersion of the mutineers. When the assault on the city was at last ordered, gen. Nicholson (for to this rank he had now attained) was selected for the post of honor; and on the morning of Sept. 14, he led the first column of attack. After the troops had forced their way into the city, an unforseen check occurred, and Nicholson, ever in front, exposed himself in the most fearless manner to animate his men to advance. Conspicuous by his towering stature, he became the mark of the enemy's bullets, and fell, shot through the body. He lingered for some time in great suffering, and died on the morning of the 23d. Over the whole of India, the victory was saddened by his death; for it was felt that in John Nicholson, to use lord Canning's expression, "a tower of strength" had fallen. During the whole war of the mutiny, though it claimed many noble victims, there fell no man more regretted in his death than Nicholson, or in his death more worthy of regret. Throughout his career, he shone—as opportunity offered—a veritable "king of men;" one of those born to command, who naturally and inevitably rise to it, and however great in achievement, seem to need only the hap of ampler opportunity in the future, to outsoar their great achievements in the past. No one ever seems to have come fairly in contact with him without being strangely impressed with this sense of a magnificent reserve of *power* in him. It remains only to add, that his nature was on the one side as gentle, tender, and affectionate, as on the other it was strong and brave: and that, by all who had intimate relations with him, he was not less beloved for his mild virtues, than for his sterner gifts honored and admired. To his memory all honor was paid. The queen commanded it to be officially announced that, had he lived, he would have been created a knight commander of the bath; and by the East India company, a special grant of £500 a year was voted to the mother who survived to mourn for him.—For further details of the life of this man of right noble and heroic mold, the reader is referred to the account of him—from which this little sketch is redacted—given in Kaye's most interesting work entitled *Lives of Indian Officers* (2 vols., Lond., A. Strahan & Co., 1867).

NICHOLSON, JOHN B., 1783–1846; b. Va., joined the U. S. navy as midshipman in 1800. In 1812 he was promoted to lieut., and on the breaking out of the war with England was ordered on board the *United States*, serving as 4th lieut. He was present at the engagement which terminated in the capture of the *Macedonian*, and was 1st lieut. of the *Peacock*, bringing in the prize ship *Epervier*. In 1828 he was promoted capt., and afterward to the rank of commodore.

NICHOLSON, SAMUEL, 1743–1811; b. Md.; brother of James. He was lieut. under Paul Jones in the *Bon Homme Richard*, and took part in the fight between her and the

Serapis. He was promoted to a captaincy in 1779, and in 1782 commanded the frigate *Dean*, of 32 guns, and made a long cruise, during which he captured a number of prizes, including 3 sloops-of-war. He retained the rank of capt. after the reorganization of the navy, and was the first commander of the frigate *Constitution*. At the time of his death he was the senior officer in the service.

NICHOLSON, William Carmichael, 1800–72: b. Md., entered the navy in 1812. He was attached to the *President*, under Decatur, and took part in the engagement off Long Island, in Jan., 1815, which resulted in her capture by a British squadron. He was made lieut. in 1821, and commander in 1841. He commanded the sloop *Preble* in the Mediterranean squadron in 1843, and the schooner *Boxer* in the Pacific squadron in 1850. He was appointed fleet-capt. of the Pacific squadron in 1855, and commanded the steam-frigate *Mississippi* in the East India squadron 1858–60. He was stationed at the naval asylum in Philadelphia at the beginning of the rebellion, and soon afterwards was placed in command of the steam-frigate *Roanoke*. He became commodore in 1862, and was retired in 1864.

NIC'IAS, a famous Athenian statesman and gen. during the Peloponnesian war, was the son of Niceratus, a very wealthy citizen, who had acquired his fortune by working the silver-mines at Laureium. Nicias belonged to the aristocratic party, and after the death of Pericles presented himself as the opponent of Cleon, the great popular or demagogic leader. He was not a man of quick, brilliant, audacious genius, like Alcibiades; on the contrary, he was remarkably wary and cautious, even at times to timidity. Success generally accompanied his enterprises against the Spartans and their allies. In 427 B.C., he captured the island of Minoa; next year he ravaged the island of Melos and the coasts of Locris; the year following that he obliged the Spartan force in Sphacteria to surrender, and also defeated the Corinthians. In 424 B.C. he made havoc of part of Laconia, captured the island of Cythera, and achieved several other successes. After the death of Cleon he brought about a peace between the Spartans and Athenians, 421 B.C. Six years afterwards the Athenians, at the instigation of Alcibiades, resolved on a great naval expedition against Sicily. Nicias was appointed one of the commanders, although he had strongly protested against the undertaking. In the autumn of 415 B.C. he laid siege to Syracuse, and was at first successful, but subsequently experienced a series of disasters; his fleet was destroyed, and his troops began a retreat towards the interior of Sicily. They were speedily forced to surrender, and Nicias was put to death 414 B.C. See Thirlwall's and Grote's *Histories of Greece*, and Plutarch's *Life of Nicias*.

NICKEL (symbol, Ni; equiv. 29·5—new system, 59—sp. gr. 8.8) is a grayish-white glistening metal, capable of receiving a high polish, of about the same hardness as iron, and, like that metal, malleable and ductile. It has about the same fusibility as wrought iron, but is less readily oxidized than that metal, since it remains unchanged for a long time in a moist atmosphere, and is very little attacked by dilute acids. It is strongly magnetic, but loses this property when heated to 600°. It dissolves in hydrochloric and dilute sulphuric acid with a development of hydrogen gas, and is very readily oxidized in nitric acid.

Nickel only occurs in the native state in meteoric stones, in which it is always present in association with the iron which forms the principal part of those masses. It is found in tolerable abundance in Saxony, Westphalia, Hungary, Sweden, etc., where it occurs in the form of *kupfernickel* (so called from its yellowish-red color), which is a combination of nickel and arsenic. The metal is obtained on the large scale for the purpose of making German silver (q.v.) and other alloys, either from this compound or *speiss*, which is an impure arsenio-sulphide of nickel, formed during the manufacture of *smalt* (q.v.), by somewhat complicated chemical processes. In small quantities it may be obtained by reducing one of its oxides by means of hydrogen at a high temperature, or by exposing the oxalate to a very high temperature in a crucible lined with charcoal.

Nickel forms two compounds with oxygen—viz., a protoxide, NiO, and a sesquioxide, Ni_2O_3, which is not basic, and may be passed over without further notice. The *protoxide* occurs as a greenish-gray powder, which exhibits no magnetic properties, and is insoluble in water. It is obtained by heating the carbonate or the *hydrated protoxide* in a closed crucible. The hydrated protoxide, NiO,HO, is obtained by precipitation from a solution of one of its salts by potash. The salts of the protoxide and their solutions are of a delicate, very characteristic green color; but in the anhydrous state most of them are yellow. The neutral salts, soluble in water, slightly redden litmus, have a sweetish, astringent, metallic taste, and when administered in moderate doses excite vomiting. The most important of the salts is the sulphate (NiO,SO_3+7 Aq), which crystallizes in beautiful green rhombic prisms. It is obtained by dissolving the metal or its oxide in dilute sulphuric acid; and is the source from which the other salts of nickel, the carbonate, oxalate, etc., are obtained. The principal use of nickel is in the composition of various alloys, such as German silver (q.v.).

The sulphate of nickel has been prescribed successfully by professor Simpson in cases of severe headache.

NICKEL (*ante*). Nickel has three sulphides, or sulphurets, a subsulphide, Ni_2S, which is formed by reducing the sulphate with charcoal or hydrogen; the protosulphide, NiS, formed by fusing sulphur and nickel, and also found native in the mineral millerite; and the disulphide NiS_2, obtained by heating the carbonates of nickel and potash with sulphur to redness. An anhydrous carbonate $NiCO_3$, is made by heating chloride of nickel with carbonate of potash or soda in a sealed tube. It crystallizes in minute rhombohedrons. A hydrocarbonate, $NiCO_3$, $2\ Ni\ (H_2O)_2$, also exists as a native mineral, called emerald nickel, and found in mines in the form of incrustations and short stalactites; sometimes massive; pearly luster, emerald-green color, transparent, translucent; hardness 3 to 3.25; sp. gr. 2.57 to 2.69. Occurring in Lancaster co., Penn., associated with serpentine, and also in the Shetland islands. The nitrate $Ni,2NO_3,6H_2O$ crystallizes in 8-sided emerald-green prisms, soluble in twice their weight of cold water. It is made by dissolving the metal in nitric acid. Sulphate of nickel, $NiSO_4 7H_2O$ crystallizes in green rhombic prisms, soluble in 3 parts of cold water. It is made by the action of dilute sulphuric acid on the metal. When these crystals are exposed to the light they subdivide, without falling apart, into minute regular octahedrons. If the crystallization takes place between 59° and 77° F. it will be octahedral, and instead of 7, there will be only 6 molecules of water. The methods of smelting and working nickel ores are complicated, and some of them are not generally known. The uses of nickel until recently were principally for forming alloys with other metals. In some countries besides the United States, coins of small value have been made of an alloy of nickel, zinc, and copper. The U. S. cent, authorized by the act of Feb. 21, 1857, was composed of 88 per cent of copper and 12 per cent of nickel. The metal is used in the preparation of the alloy called German silver, which contains 2 parts of copper and 1 of zinc and nickel each. White copper, or *pakfong*, of China, consists of copper, 40.4; nickel, 31.6; zinc, 25.4; iron, 2.6. Recently nickel has been used for plating other metals, and this use has made it one of the most valuable of metals. Chemists had for some time known that a brilliant deposit of nickel could be obtained by electrolysis from solutions of nickel salts, but no advantage was taken of this knowledge till Mr. Isaac Adams of Boston devised a method of rendering nickel-plating practicable and profitable. He employs a double chloride of nickel and ammonium, or of sulphate of nickel and ammonium. See *Electrolysis*, *Electro-Metallurgy*, and *Electrotype*, in art. GALVANISM, *ante*. It is important to have the salt which is used in the process perfectly pure, and it must therefore be made from pure nickel. Mr. Adams found that it was not practical to use a plate of pure metal as the *anode*, because it would not dissolve sufficiently fast to satisfy the demands of the solution (the deposit of metal on the *cathode*, and consequently its separation from the salt, being the greater). This was remedied by combining the nickel *anode* with carbon, forming a carbide. This causes the metal to dissolve exactly as fast as it is deposited.

NI'COBAR ISLANDS, a group of islands in the Indian ocean, n.w. of Sumatra, and forming, with the Andamans (q.v.), an extension of the great island chain of which Java and Sumatra are the principal links. Lat. 6° 40′ to 9° 20′ N., long. 93° to 94° east. They are divided by the Sombrero channel into two groups, of which the principal members are the Great Nicobar (area 260 sq.m.), and the little Nicobar (area 86 sq.m.). The inhabitants, who are not numerous, are distinct from Malays and Burmese, and are said to resemble the hill-tribes in Formosa. The Danes made a settlement here in 1754, were dispossessed by Great Britain from 1807 to 1814, and finally withdrew in 1848. In 1869, the Indian government took possession of these islands, and affiliated the new settlement at Nancowry harbor to the great penal colony at Port Blair in the Andaman islands. The soil is fertile, and the cocoa-nut palm grows abundantly.

NIC'ODEMUS, a Pharisee, member of the Jewish sanhedrim, or great council of the nation, who, impressed by what he had heard of Jesus, and perhaps convinced that he was the Messiah, came by night for fuller private converse. He may have come in secret through fear or prudence; he may have found it impossible to meet Christ alone without interruption in the day time. He received memorable instruction, (John iii.) He appears in two scenes afterwards—the first, when at the sitting of the great council he ventured in a few words to defend Jesus against the unjust suspicions of the Jews: the second, when he united with his colleague Joseph of Arimathea in rendering the last honors to the crucified Jesus. Scripture gives no other information of him Tradition relates that having declared himself a follower of Christ, and been baptized by Peter, he was removed from his office and expelled from Jerusalem; that he found refuge in a country-house of Gamaliel his cousin, with whom he remained until his death. The so-called *Gospel of Nicodemus* or *Acts of Pilate* is undoubtedly spurious, and of no value.

NICOL, HENRY, 1846–81, b. England; completed what education he received at school before he was seventeen, being then obliged to take a clerkship in a merchant's office, and which he continued to hold until failing health necessitated his relinquishing it a year before his death. He devoted his leisure from business to the study of philology, and with such success that he eventually gained a European reputation for his wide range of knowledge in that department of research. He particularly attached himself to the study of old French; and concerning this *The Academy* said at the time of his death: "England has lost its first romance and old-French scholar, and one of its foremost English and general philologists."

NICOLAI, CHRISTOPH FRIEDR., a celebrated German author. bookseller, and publisher, was b. Mar. 18, 1733, at Berlin, where his father was also a bookseller. He devoted himself very earnestly to literary and philosophical studies, and early distinguished himself by his *Briefe über den jetzigen Zustand der schönen Wissenschaften* (Berl. 1756), in which he exposed the errors of both Gottsched and Bodmer, then carrying on a controversy which was agitating the literary world of Germany. He became the associate of Lessing and Moses Mendelssohn. Jointly with the latter he edited for some time the admirable *Bibliothek der schönen Wissenschaften* (Leip. 1757–58); and with Lessing, he gave to the world *Briefe, die neueste deutsche Literatur betreffend* (24 vols. Berl. 1759–65). By this he was led to conceive the plan of the *Allgemeine deutsche Bibliothek* (106 vols. 1765–92), a periodical which he edited for many years, and which contributed much, particularly in the early period of its existence, to the progress of literature and improvement of taste in Germany, but was too frequently characterized by an undue acerbity of tone. Nicolai's hostility to the new schools of literature and philosophy, which sprang up in Germany, exposed him to attacks from the pens of Herder, Goethe, Schiller, Lavater, and Fichte. His death took place Jan. 8, 1811.

Among Nicolai's works may be mentioned his *Topographisch-historische Beschreibung von Berlin und Potsdam* (Berl. 1769, 3d edit. 1786); *Characteristischen Anecdoten von Friedrich II.* (Berl. 1788–92), both of permanent value; some novels, as his *Leben und Meinungen des Magisters Sebaldus Nothanker* (4th edit. Berl. 1799); *Geschichte eines dicken Mannes*, a sharply satirical performance (2 vols. Berl. 1794); *Beschreibung einer Reise durch Deutschland und die Schweiz* (Berl. 1781; 3d. edit. 12 vols. 1788–96); an autobiography, published in the *Bildnisse jetzt lebender Berliner Gelehrten;* and a work entitled *Ueber meine gelehrte Bildung, über meine Kenntniss der Critischen Philosophie und meine Schriften dieselbe betreffend* (Berl. 1799).

NICOLAI, Otto, a German musical composer of note, b. at Königsberg in 1809. His early life was a struggle with poverty and difficulties. He studied for three years in Berlin under Klein; and in 1835 went to Rome, where he went through three more years of study under Baini. After traveling for ten or twelve years over Europe, he became, in 1847, Kapellmeister at Berlin, a post which he soon resigned. He appeared as a composer of dramatic music as early as 1831; but his first work of importance was *Il Templario*, founded on Scott's romance of *Ivanhoe*, which, produced at Turin in 1841, attained a high and permanent reputation. In 1848 he wrote at Berlin *Die Lustigen Weiber von Windsor*, on which his renown as a musician is founded, a work charming for its clear design and lively vigorous tone, whose overture is almost worthy of Weber. Two months after the production of this his *chef-d'œuvre*, its composer died at Berlin.

NICOLAITANS, a class of persons, spoken of Rev. ii. as found in the churches of Ephesus and Pergamos, whose doctrine and deeds were hateful to Christ. Irenæus, who wrote near the close of the 2d c., and is the earliest author who mentions them, says that they were followers of Nicolas of Antioch, one of the seven deacons chosen at Jerusalem. As there was a traitor among the "twelve," there may have been an immoral man among the "seven;" but in the absence of all contemporary evidence a statement made a hundred years after the writing of the Revelation has no force against the presumptive evidence that a man who was one of seven selected from the whole church of Jerusalem as of "tested character, full of the Holy Ghost, and of wisdom," did not afterwards become notorious as a teacher and perpetrator of abominable crime. As to the particular character of the offenses taught and practiced by these persons, many vain conjectures have been made. The ingenious suggestion of Michaelis is not improbable, that those thus condemned by Christ were of similar character with "the followers in the way of Balaam;" described by Peter in his second epistle; and that *Nicolaitans* is simply the Greek translation of the Hebrew "*Balaam*," both signifying *conquerors* or *masters of the people*. This theory is supported by the fact that in the Revelation, while the church of Pergamos is censured for tolerating within it persons who held the doctrine of Balaam, after the special character of the crimes he had taught Israel to commit has been described, it is added "*even so* thou also hast those who hold the doctrine of the Nicolaitans."

NICOLAS, Nicholas Harris, 1799–1848; b. England; entered the navy as a midshipman in 1808, and after some years of active service was promoted to the rank of lieut. Shortly afterwards, however, he retired from the service and devoted himself to the study of English law and antiquarian literature, and in 1825 was called to the bar. He soon distinguished himself as a peerage lawyer and a writer on antiquarian subjects. In 1826 he became joint editor of *The Retrospective Review;* and in 1831 he was made a knight of the Hanoverian Guelphic order. Among his numerous works, those which are best known are, *Synopsis of the Peerage of England* (1825); *Testamenta Vetusta* (1826); *Chronology of History* (1835); *History of the Battle of Agincourt; Dispatches and Letters of Lord Nelson* (1844); and *Memoirs of Sir Christopher Hatton* (1847).

NICOLE, Pierre, 1625–95, b. Chartres, France; at an early age attained unusual proficiency in philosophy and classical studies, and when but fourteen began at Paris a course of philosophical and theological study. Here he came much under the influence of Anthony Arnauld (q.v.), and was deterred from taking orders by his views on the Jansenist discussion and his dislike of the Jesuit power. He attached himself to the recluses (*solitaires*) of Port Royal (q.v.) at Les Granges, and became an instructor in the Jansenist schools, while continuing the study of theology at the Sorbonne. From this time he devoted his pen to extending and expounding the doctrines of Jansenism, though he did not fully agree with the extreme advocates of that system. The number of his moral, religious, and controversial treatises is large, all characterized by purity of style, subtilty of discrimination, and a broad and generous humanity. To him more than any other writer is the Port Royal logic (*La Logique, ou l'art de Penser*, 1668) to be attributed. Others of his works are: *Perpétuité de la Foi; Les Visionnaires; Essais de Morale*, in 6 volumes, 2 published posthumously; his philosophical reputation rests mainly on the essays and logic. Personally, he was a man of great humility and modesty, and was so far from seeking public applause that in more than one instance he did not deny the belief that a work of his own was written by others of the Port Royal brotherhood. He labored incessantly in his chosen work till, worn out by the controversy which was so little suited to his natural disposition, in 1693 he was compelled by increasing illness to desist, and 2 years afterwards was followed to his grave by the most distinguished men of his time.

NICOLET, a co. in s. Quebec, having the St. Lawrence river for its n. and n.w. boundary, drained by the Becancour river, the Nicolet and West Branch, which form part of its s.w. border; 595 sq.m.; pop. '71, 23,262. It is traversed by the Three Rivers division of the Grand Trunk railway. It has several flour and saw mills, boot and shoe factories, and an extensive trade in lumber. Its soil is fertile along the rivers, and its surface is covered with immense forests, diversified with plains adapted to the cultivation of grain. Co. seat, Becancour.

NICOLLET, a co. in s. Minnesota, having the Minnesota river for its e., s., and w. boundary; 470 sq.m.; pop. 12,333—7,148 of American birth, 3 colored. It is intersected by the Winona and St. Peter, and the St. Paul and Sioux City railroads, forming a junction at St. Peter. It is drained by numerous lakes, the largest, Swan lake, nearly 9 m. long. Its surface is extensively covered with forests, but a large proportion stretches out into broad prairies. The foundation of the soil in some portions is silurian limestone. Its products are grain, potatoes, wool, sorghum, the products of the dairy, and live stock. Its leading industries are the manufacture of brick, furniture, leather, and flour. Co. seat, St. Peter.

NICOLLET, Jean Nicolas, 1786–1843. b. France; studied under Laplace, and in 1817 was appointed librarian of the Paris observatory. In 1802 he came to this country on a scientific expedition, and explored the territory drained by the Missouri, Arkansas, and Red rivers, and the upper Mississippi. He obtained much valuable information on the natural history of the districts which he visited, and on the languages and customs of the Indian tribes. Soon after his return he was sent, with John C. Fremont, to the western territories, to make a general report of their resources and draw up a map of them. He published *Mémoire sur la mesure d'un arc de parallèle moyen entre le pôle et l'equateur;* and *Lettre sur les assurances qui ont pour base les probabilités de la durée de la vie humaine.*

NICOMACHUS, a Greek painter in the 4th c. B.C., a son and scholar of Aristodemus. Little is known of his life. Plutarch compares his paintings to the poems of Homer, and Cicero ranks him with Protogenes and Apelles. Pliny notices the following of his works: *The Rape of Proserpine*, in the temple of Minerva, on the capitol; *Victory riding in a four-horse chariot*, also in the capitol; *Apollo and Diana*, *Cybele on a Lion*, *Female Bacchanals*, and *Scylla*. He was celebrated for the swiftness with which he executed. Among his scholars were several great painters, such as his brother Aristides, his son Aristocles, Philoxenus of Eretora, Nicophanes, and Corybar

NICOME'DEIA, the capital of ancient Bithynia, was situated at the north-eastern angle of the gulf of Astacus, in the Propontis, now called the bay of Ismid; was built about 264 A.D. by Nicomedes I., who made it the capital of his kingdom, and it soon became one of the most magnificent and flourishing cities in the world, and some of the later Roman emperors, such as Diocletian and Constantine the great, selected it for their temporary residence. It suffered greatly both from earthquakes and the attacks of the Goths. Constantine died at a royal villa in the immediate vicinity. Hannibal committed suicide in a castle close by. It was the birthplace of the historian Arrian. The small town of Ismid or Isnikmid now occupies its site, and contains many relics of ancient Nicomedeia.

NICOP'OLIS, recently a Turkish fortress, but since 1878 a city of the newly-constituted principality of Bulgaria, is on the Danube, about 56 m. w. of Rustchuk. The fortifications, though extensive, were never of much importance, and the Berlin congress of 1878 provided for their demolition. The city used to be divided into two portions: the fortress and Turkish town, defended on every side by batteries and ramparts, and the eastern quarter, comprising the dwellings of the Bulgarians, Wallachs, and Jews. Nicopolis is widely built, most of the houses being surrounded by gardens. It is an important market for Wallachian wares, but otherwise is not a great center of trade. Wine is produced in the vicinity. Pop. 16,000.

Nicopolis, the ancient *Nicopolis ad Istrum*, was founded by Trajan, and fragments of the old wall still remain. Here the Hungarians, under their king Sigismund, were defeated by the sultan Bajazet I. in 1396. The city gives title to a Greek archbishop and to a Catholic bishop

NICOPOLIS in Epirus, one of the many cities bearing the same name—"city of victory"—founded by Augustus to commemorate his victory over Antony in the battle of Actium; immediately after which he inclosed and dedicated to Neptune the space where his tent had been pitched, on a height which commanded a view of both the land and sea forces. Here he afterward built the city, and made it a Roman colony. "Some of the finest parts," Josephus says, "were the work of Herod, who was one of the greatest builders of his day." His connection with it, added to the well-known wide diffusion of the Jews into all the principal countries and cities, renders it probable that many of them lived there. Paul, in his letter to Titus, announced his purpose to pass the winter at Nicopolis; the subscription to the epistle asserts that Paul wrote it at Nicopolis of Macedonia, implying that it was there that he intended to pass the winter. But his language shows that he had not yet gone to Nicopolis, and the subscription to the epistle has no authority. Jerome's opinion is generally adopted, that it was the Augustan Nicopolis to which Paul referred. Its situation was convenient, as a central point, in some of his journeys east and north. He had, long before, preached at Illyricum, and one of his last official acts was to send Titus—probably after he had joined him at Nicopolis—on a mission to Dalmatia. Possibly he was arrested at Nicopolis soon afterward, and taken finally to Rome. At this time the city, though only about 30 years old, had become the chief place in western Greece. As it owed its origin and importance to war, so it was destroyed by hostile armies. Julian, finding it in ruins, rebuilt it. Again destroyed by the Goths, Justinian restored it a second time. During the middle ages a new city was built at the point of the promontory, and the "city of victory" was deserted. The ruins, covering a large portion of the isthmus, still show its original grandeur and size. Wordsworth thus speaks of them: "A lofty wall spans a desolate plain; to the north of it rises, on a distant hill, the shattered stage of a theater; and to the west, the extended though broken line of an aqueduct connects the distant mountains with the main subject of the picture—the city itself." There are also ruins of a mediæval castle and other buildings on the low, marshy, and now desolate plain.

NICOSI'A, a city of Sicily, in the province of Catania, 70 m. s.w. from Messina. It is situated on the crest of a steep, conical hill between two head-branches of the Salso. It has scarcely any manufactures, but carries on some trade in corn, wine, oil, and cattle. Near it are beds of alum, schist, a rich mine of rock-salt, and springs of petroleum. Pop, 14,250.

NICOSIA. See Lefkosia, *ante*.

NICOT, Jean, 1530–1600, b. France; a diplomatist appointed by Francis II. ambassador to Portugal. During his residence at Lisbon he obtained, from a Flemish trader, some seeds of the tobacco plant from Florida. Nicot subsequently introduced tobacco into France, and it was called, in his honor, *Nicotiana*. He wrote a treatise on navigation, and *Treasury of the French Language*, one of the earliest French dictionaries.

NICOTIANA. See Tobacco.

NI'COTINE, or Nicoty'lia ($C_{20}H_{14}N_2$), is one of the natural volatile oily bases destitute of oxygen, and constitutes the active principle of the tobacco plant, in the leaves, roots, and seeds of which it occurs in combination with malic and citric acids. It is likewise contained in the smoke of the burning leaves. It is a colorless, intensely poisonous liquid, of specific gravity 1.027 at 66°, which boils at 480°, evolves a very irritating odor of tobacco, especially on the application of heat, is very inflammable, and burns with a smoky flame. It is moderately soluble in water, and dissolves readily in alcohol and ether. If exposed to the air, it absorbs oxygen, and becomes brown, and ultimately solid. The quantity of nicotine contained in tobacco varies from 2 to 8 per cent; the coarser kinds containing the larger quantity, while the best Havana cigars seldom contain more than 2 per cent, and often less.

A remarkable case of poisoning by nicotine—that of the count Bocarmè, who was tried and executed in Belgium for the murder of his brother-in-law—is recorded in the *Annales d'Hygiène* 1851, and was the occasion of Orfila's publishing his *Mémoire sur la Nicotine*. A distinguished student of the college of chemistry subsequently employed it for the purpose of suicide. The deaths that have taken place from the use of tobacco in the form of injection—of which several cases are on record—were doubtless due to the action of this substance.

NICO'YA, Gulf of, opens into the Pacific ocean from n.w. Costa Rica, lying between the main land and the peninsula of Nicoya, which terminates in cape Blanco; this cape being situated at the w. side of the gulf of Nicoya, at its mouth, and cape Herradura on the east. It is about 55 m. long, lying n. and s., and 30 m. wide at its mouth. Punta Arenas, the sole port of entry on the Pacific side of Costa Rica, is situated on the e. side of the gulf. In it are a number of small islands among which are San Lucar, Bejuca, Chira, and Venado. Several streams empty into it, the chief of which are the Tempisque, Rio Grande, and Nicoya rivers.

NIEBUHR, Barthold Georg, one of the most acute historians, critics, and philologists of modern times, was b. Aug. 27, 1776, at Copenhagen, where his father, Karsten Niebuhr (q.v.), then resided. The aptitude for learning which Niebuhr displayed almost from infancy, led him to be regarded as a juvenile prodigy, and unlike many other precocious children, his powers of acquiring knowledge kept pace with his advancing years. After a carefully conducted preliminary education, under the superintendence of his father, he spent a session at Göttingen studying law, and from thence proceeded in his 19th year to Edinburgh, where he devoted himself more especially to the natural sciences. On his return to Denmark, he became private secretary to the finance minister, Schimmelmann, and from that period till 1804 held several appointments under the Danish government, which, however, he was led to resign in consequence of his strongly pronounced political tendencies, which made him enter heart and soul into the feeling of hatred of Napoleon, which was at that time agitating the minds of Germans. In accordance with these views, Niebuhr entered the Prussian civil service in 1806, and during the three succeeding years he shared in the vicissitudes which befell the government of his chief, count Hardenberg, after the disastrous battle of Jena, and the consequent pressure of the Napoleonic influence on the management of the state. The opening of the university of Berlin in 1810 was a new era in the life of Niebuhr, who, with a view of promoting the interests of the new institution, gave a course of lectures on Roman history, which, by making known the results of the new and critical theory which he had applied to the elucidation of obscure historical evidence, established his position as one of the most original and philosophical of modern historians. His appointment, in 1816, to the post of Prussian ambassador at the papal court, where he remained till 1823, gave him an opportunity of testing on the spot the accuracy of his conjectures in regard to many questions of local and social bearing. On his return from Rome, Niebuhr took up his residence at Bonn, where, by his admirable lectures and expositions, he contributed very materially to the development of classical and archæological learning. He was thus employed when the revolution of 1830 roused him from the calm of his literary pursuits. Niebuhr's sensitive nature, unstrung by physical debility, led him to take an exaggerated view of the consequences of this movement, and to anticipate a recurrence of all the horrors of the former French revolution, and the result was to bring about a state of mental depression and bodily prostration, which ended in his death in January, 1831. Niebuhr's attainments embraced a more extensive range than most men are capable of grasping, for he was alike distinguished as a shrewd man of business, an able diplomatist, an accurate scholar, and a man of original genius. He had mastered 20 languages before the age of 30, while the mass of facts which his tenacious memory retained, and the intuitive sagacity that enabled him to sift true from false historic evidence, and often to supply by felicitous conjecture the link wanting in some imperfect chain of evidence, exhibit the extraordinary scope of his intellect. It is not to be denied, however, that he is often arbitrary and unhistorical in his conjectures, and the stricter sort of skeptical critics, like the late sir George Cornewall Lewis, even go so far as to regard his effort to construct a continuous Roman history out of such legendary materials as we possess as, on the whole, a failure. Among the many important works with which he enriched the literature of his time, the following are some of the most noteworthy: *Römische Geschichte* (3 Bde. Berl. 1811–32; 2d edit. 1827–42; 1833; 1853), the first two volumes have been translated by J. C. Hare and C. Thirlwall, and the third by Dr. W. Smith and Dr. L. Schmitz; *Grundzüge für die Verfassung Niederlands* (Berl. 1832); *Griech. Heroengeschichte* (Hamb. 1842), written for his son Marcus; the *Kleinen historischen und philologischen Schriften* (2 Bde. Bonn, 1828–43), contain his introductory lectures on Roman history, and many of the essays which had appeared in the transactions of the Berlin academy. Besides these, and numerous other essays on philological, historical, and archæological questions, Niebuhr co-operated with Bekker and other learned annotators in re-editing *Scriptores historiæ Byzantinæ;* he also discovered hitherto unprinted fragments of classical authors, as, for instance, of Cicero's *Orations* and portions of Gaius, published the *Inscriptiones Nubienses* (Rome, 1821), and was a constant contributor to the literary journals of Germany. See Miss Winkworth's *Life and Letters of Niebuhr* (3 vols., 1852); Classen's *Niebuhr* (1876).

NIEBUHR, KARSTEN, a distinguished geographer and traveler, was b. in 1733, in the Hanoverian territory of Hadeln, on the confines of Holstein. Being early thrown on his own resources, he spent several years of his youth in the position of a day-laborer; but his natural energy having led him to apply himself to the study of geometry, and having acquired a small property, he went to Göttingen, where he attended the classes at the university until his resources were wholly exhausted. At this period he entered the Danish service, and in 1761 he joined the scientific expedition which king Frederick V. sent to explore certain portions of Arabia, with a view of illustrating some passages of the Old Testament. The expedition reached Cairo at the close of the year 1761, and after having carefully explored the pyramids, and crossed the desert to mount Sinai and Suez, proceeded to Arabia Felix. Here, however, the various members of the expedition, which included the eminent naturalist Forskål, all perished with the exception of Niebuhr, who had himself suffered severely from fever. After the untimely death of his companions, he adopted the diet and dress of the natives—a measure to which he was probably indebted for the good health which he enjoyed during the rest of the travels, which he prosecuted with extraordinary resolution for more than six years. He proceeded as far as India, visiting also Persia and Asiatic Turkey, and continued the observations and researches of his late colleagues in addition to his own special geographical investigations. On his return to Denmark, in 1767, Niebuhr at once devoted himself to the task of publishing the results of his important mission, which appeared in German under the following titles, *Beschreibung von Arabien* (Copenh. 1772), and *Reisebeschreibung von Arabien und andern umliegenden Ländern* (Copenh. 1774–78, 2 vols.); the publication of the third volume of this work was unfortunately delayed, in consequence of the pressure of numerous other engagements arising from his professional and official duties, and it was not till more than 20 years after his death that the book made its appearance under the supervision of Niebuhr's daughter, and through the liberality of the eminent bookseller Perthes of Hamburg. In addition to these valuable observations, Niebuhr edited and published at his own cost the natural-history notes of his deceased friend and fellow-traveler, P. Forskål, which he arranged in two works, *Descriptiones Animalium*, etc. (Copenh. 1775), and *Flora Ægyptiaco-Arabica* (Copenh. 1776). The accuracy of detail, fidelity of delineation, and careful avoidance of all exaggeration, which characterize Niebuhr's geographical and social descriptions of Arabia and other Asiatic countries, have made his works classical text-books for all who wish to study the subject. Although Niebuhr accepted, in 1778, a civil post, which fixed his residence in the remote provincial town of Meldorf, in the Ditmarsh district of Holstein, where he devoted himself during the rest of his life to the fulfillment of his official duties, he never relinquished his interest in scientific inquiry, and contributed several valuable papers on the geographical and political history of the nations of the East to the *Deutsche Museum*, and other periodicals. He died in 1815, leaving a character of being at once one of the most truthful and scientifically exact travelers of modern times.

NIÉDERMEYER, Louis, 1802–61, b. in Switzerland; when very young showed a strong taste for musical composition; afterward studied under Moscheles and other eminent masters at Vienna and Rome. His first opera was produced at Naples, but of several composed by him, *Stradella* (1836) was the only one which had much success. He also set to music a number of songs by Victor Hugo, Lamartine, and Manzoni. Perhaps the best of his works are his religious compositions which display great originality.

NIEL, Adolphe, 1802–69; b. France, having studied at the École polytechnic in 1821, and received a military education at the military academy of Metz, in 1827 he was made lieut. of engineers, in 1835 was promoted to capt., and accompanied the expedition against Constantine in Algeria, under generals Damrémont and Vallé in 1836–37. Gaining much distinction for bravery, he was raised to *chef-de-battaillon* and placed in command of the engineering corps in Algeria. He was raised to the rank of col. in 1846. In 1849, as the head of the staff of engineers he took part in the suppression of the revolutionary movements at Rome then defended by Garibaldi who surrendered after a siege of two months. He was then promoted to the rank of brig.gen. and accomplished the official duty delegated to him, of carrying the key of the city to the pope at Gaeta. Returning to Paris he was appointed director of the engineering department in the ministry of war, and in 1853 was raised to the rank of gen. of division, and in alliance with the English fleet, conducted the siege which destroyed the important Russian fortress of Bomarsund in Aug., 1854. He planned the operations through which Sevastopol was overcome, by the allied armies of England and France, in 1854–55, after a siege of 11 months, and commanded the engineers in the Crimea. He was aid-de-camp to the emperor, and after the taking of the Malakoff was decorated with the cross of the legion of honor. In 1859 he was sent as ambassador to the court of Victor Emmanuel, to demand the hand of princess Clothilde for prince Napoleon. He distinguished himself in the campaign in which occurred the battle of Solferino, June 24, 1859, and was made a marshal of France. In 1867 he was minister of war, and throughout his career sustained a high reputation as a scientific military officer.

NIEL'LO-WORK, a method of ornamenting metal plates by engraving the surface, and rubbing in a black or colored composition, so as to fill up the incised lines, and give effect to the intaglio picture. It is by no means quite certain when this art was originated; Byzantine works of the 12th c. still exist to attest its early employment. The finest works of this kind belong to the former half of the 15th c., when remarkable excellence in drawing and grouping minute figures in these metal pictures was attained by Maso di Finiguerra, an eminent painter, and student of Ghiberti and Massacio. In his hands it gave rise to copper-plate engraving (see ENGRAVING), and hence much interest attaches to the art of niello-cutting. Genuine specimens of this art are rare, some of those by Finiguerra are very beautiful and effective, the black pigment in the lines giving a pleasing effect to the surface of the metal, which is usually silver. Those of his works best known are some elaborately beautiful pattines wrought by him for the church of San Giovanni at Florence, one of which is in the Uffizia, and some are in various private collections. In the collection of ornamental art at South Kensington, there are no less than 17 specimens of this art.

NIEMANN, Albert, b. Germany, 1831; at first a singer in the chorus at Dessau. The magnificence of his tenor voice attracted the attention of the king of Hanover, who took him into his service. Wagner selected him to sing in *Tannhäuser* on its first production in Paris in 1861.

NIEMBSCH VON STREHLENAU. See LENAU, NIKOLAUS, *ante*.

NIEMCEWIECZ, JULIAN URSIN, 1757-1841, b. Poland; entered the army as an adjutant at the age of 20, and became an intimate friend of Kosciuszko. After a tour in England and on the continent, he left the army in 1788, and entered the Polish diet as a deputy from Livonia, and became an advocate of the patriotic party. In 1791 with his colleague Weyssenhoff, he began the publication of the *National and Foreign Gazette*, and he also encouraged the spirit of nationality by his poems and dramas. He drew up the so-called "constitution of the 3d of May," which changed Poland from an elective to an hereditary monarchy, and abolished many of the privileges of the nobility. In the insurrection caused by the second partition of Poland, Niemcewiecz was the adviser and aid-de-camp of Kosciuszko; and he was wounded and taken prisoner at the disastrous battle of Macieiowice. During his imprisonment of 2 years, at St. Petersburg, he familiarized himself with the English poetry of the 18th c., and translated Pope's *Rape of the Lock*. On his release he came with Kosciuszko to this country, where in 1800. he married Mrs. Livingston-Kean of New York. Among his acquaintances in America, were Jefferson, and the exiled duke of Orleans, who afterwards became king Louis Philippe. In 1802 he was allowed to return to Poland on the death of his father. He came back to the United States for a brief period; but when Napoleon entered Poland in 1806, he sailed for Europe, and on the establishment of the grand-duchy of Warsaw, the king of Saxony made him secretary of the senate, inspector of schools, and member of the supreme council of public instruction. After Poland again passed under the power of Russia, though retained by the emperor Alexander in his office of perpetual secretary, he kept alive the memories of Polish nationality, in his *Historical Ballads*, 1816. He delivered a funeral oration over Kosciuszko in 1817, and in 1822 began the publication of his *Collection of Memoirs on Ancient Poland*, celebrating the national heroes of Poland. He took part in the unsuccessful revolution of 1830, and spent the rest of his life in exile. Besides the works already named, he published novels, comedies, and tragedies. His *Notes on My Captivity in St. Petersburg*, appeared in 1843, and was translated into English, the next year. A volume of memoirs of his own time was published at Paris, in 1848.

NIE'MEN (called by the Germans *memel*) a river in Prussia, rises a few miles s. of the city of Minsk, flows westward to Grodno 180 m., n. and w. along the frontiers of the Polish province of Augustowo, and w. through East Prussia to the Kurische Haff. Entire length, 640 miles. It is navigable for large craft at Grodno, 400 m. from its mouth, and is free of ice from March to November. Between Grodno and Kovno there are 55 rapids and shallows, and pilots are therefore required for the navigation of the river. At Winge, 8 m. below Tilsit, the Niemen divides into two branches, of which the northern, the Russ, reaches the Kurische Haff by nine months; and the southern, the Gilge, by seven mouths. The delta is traversed by several canals. The Niemen is of considerable commercial importance. Large barges bring down the produce of Lithuania and of a portion of Poland to Konigsberg and Memel. Corn, hemp, flax, hides, and bacon, are the principal articles brought from the interior. Its principal affluent is the Vilna on the right.

NIEPCE, JOSEPH NICEPHORE, 1765-1833, b. France; entered the army, but resigned on account of ill-health, and in 1795 became civil administrator of the district of Nice. He resigned in 1801, and thenceforward pursued the study of chemistry and mechanics. In 1818 he made researches in regard to the production of pictures upon metallic plates by means of light. In 1824 he was able to fix images by light upon plates of glass, and afterwards of copper, and of silver covered with a thin coating of bitumen. He entered into a partnership with Daguerre in 1829.

NIEPCE DE ST. VICTOR, CLAUDE-FELIX-ABEL, a French chemist and photographer, was b. at Saint Cyr, near Chalon-sur-Saone, July 26, 1805. He served for some time in the army; but having made an important chemical discovery in connection with dyeing, he was permitted to exchange into the municipal guard of Paris, that he might pursue his scientific studies with more facility. This was in 1845, at which time his attention having been forcibly attracted to the important discoveries in photography which had been made by his uncle Nicephore Niepce (see PHOTOGRAPHY), he resolved to devote his energies to this subject. He was led, in 1847, to the discovery of methods for obtaining images on glass, coated with albumen, starch, or gelatine, and for reproducing designs by the use of vapor of iodine. His investigations were for a time interrupted by the revolution of 1848, but he soon resumed them, directing his attention more especially to the obtaining of photographic images in colors; and before the close of 1852, he had succeeded in obtaining faithfully colored images of flowers, natural and artificial, colored engravings, gold and silver lace, etc., upon silvered plates which had been sensitized by a chloride of copper. In obtaining these pictures, both photographic printing and the camera were employed; but to his intense disappointment, he found that the colors soon began to fade, and after a time disappeared. This process he named "heliochrome." His third and most important invention, that of the art of "heliography," or the production of engraved steel-plates by photography, was first communicated to the academy of sciences in May, 1853. He does not deserve the credit of having originated the idea; for his uncle, previous to 1839, had communicated an imperfect sketch of a similar invention to M. Arago; and Mr. Talbot and others had succeeded by a similar process in obtaining images of simple objects on steel plates; but to Niepce belongs the credit of having removed the almost insurmountable manipulative difficulties, and rendered the process of much more general application, thus making it practically serviceable. He afterwards employed himself in improving and perfecting his various discoveries.

In 1855 he published the various memoirs in which he had at different times communicated his three great discoveries to the academy of sciences, under the title of *Recherches Photographiques*, which was followed, in 1856, by *Traité Pratique de Gravure sur Acier et sur Verre*. He presented to the academy a number of memoirs on the action of light on a variety of substances, the last being *Sur l' Action de la Lumière et de l'Electricité* (Feb., 1860). Niepce's scientific studies did not interfere with his military promotion, as he was successively appointed chef-d'escadron, and (1854) commandant of the Louvre. He died in April, 1870.

NIER'STEIN, a market village (pop. 2,600) of Hessen-Darmstadt, in the province of Rhein-Hessen, and 9 m. s.s.e. of Mayence, gives name to a well-known and highly-prized variety of Rhenish wine, which is produced in the neighborhood.

NIESCHIN, a t. in Russia, on the Ostr river, 85 m. s.e. of Tchernigov; pop. 21,590. It contains a monastery, a cathedral, churches, an hospital, schools, and a gymnasium. The chief production and export is tobacco.

NIEU'WER AMSTEL, a t. of the Netherlands, in the province of North Holland, 5 m. s. by w. from Amsterdam. Pop. 8,066. A few miles to the e. of it is the village of Ouder Amstel, with about 3,000 inhabitants, on the Amstel, one of the smaller mouths of the Rhine, which passes through the city of Amsterdam, and falls into the Zuider Zee

NIEU'WVELDT MOUNTAINS, a portion of the most northerly of the three ranges of mountains in Cape Colony, which at various distances from the southern coast all run parallel to it. Of these three ranges, the most northern attains the greatest altitude. having an average height of 7,000 feet. The portion known as the Nieuwveldt mountains extend in lat. 31° 40′ to 32° 30′ s., and are intersected by the meridian of 22° e. longitude. From their southern slopes, the Gamka or Lion river draws its head waters; and from their northern, the Gariep or Orange river obtains an important tributary in the Upper Zak.

NIEVRE, a central department of France, occupies a portion of the watershed between the Loire and the Seine, and is bounded on the w. by the rivers Allier and Loire. Area, 2,620 sq. m.; pop., 1876, 346,822. Mountains occupy the eastern border. and extend in a line of heights from s.e. to n.w., dividing the department into two great declivities. The soil is generally rocky and sandy, cut up by ramifications, almost always wooded, of the mountains of Morwan. There are several plateaus more or less fertile, a number of hills covered with vines, and valleys productive in pastures; but the principal wealth of the department consists in its forests and minerals. The Nièvre, whence the name of the department, is an inconsiderable affluent of the Loire from the right. The three chief rivers—the Allier, Loire, and Yonne—are navigable, and the Yonne, which belongs to the system of the Seine, is connected with the Loire by a canal leading across the watershed. Of the entire area, more than 792,000 acres are cultivable land, and more than a third of the whole surface is covered with forests, the timber from which, forming one of the principal sources of wealth, is conveyed by water in great quantities to Paris, etc. About 6,000,000 gallons of wine are made yearly. From the mines of Nièvre iron of good quality is obtained in abundance; lead, copper, and silver are also found; and there are coal mines, and quarries of marble and granite. Arrondissements, Nevers, Château-Chinon, Clamecy, and Cosne; capital, Nevers.

NIFLHEIM (from the same root as Lat. *nebula*, cloud, and Eng. *home*), meaning the abode of clouds, was one of the nine separate abodes or homes, of which the old Scandinavians conceived the world as consisting in the beginning of time. It is the kingdom of cold and darkness, and is separated from Muspelsheim, the kingdom of light and heat, by a huge chasm (Ginungagap, yawning gap). Here flows the spring Hvergelmir, watched by the dragon Nidhugger; this spring sends out twelve ice-rivers, from the drops of which. thawed by sparks from Muspelsheim, sprang the chaotic giant Ymir and the cow Audhumbla. Niflheim was also the abode of Hel (q. v.), the goddess of death, who here received all who died of sickness or old age.

NIGEL'LA, a genus of plants of the natural order *ranunculaceæ*, having five colored spreading sepals; five or ten small two-lipped petals, with tubular claw; the carpels more or less connected together, many-seeded; the leaves divided into threadlike segments, the flowers solitary at the top of the stem or branches. They are annuals, natives chiefly of the countries near the Mediterranean and the warmer temperate parts of Asia. Some of them, occasionally seen in gardens in Britain, are vulgarly known by the names *Devil-in-a-bush* and *Devil-in-a-mist*. The seeds are aromatic, and somewhat peppery. Those of *Nigella sativa*, a species common in cornfields in the s. of Europe, are supposed to be the BLACK CUMMIN of the ancients, and perhaps the CUMMIN of the Bible. The seeds of a species of Nigella are much used by the Afghans for flavoring curries.

NI'GER, the great river of western Africa. Its name, according to Dr. Barth, is a contracted form of one of the native names, *N-eghírrĕu*, which, as well as all the other names, *Dhiulibá* (*Joliba*), *Mayo*, *Isa*, *Kwara* (*Quorra*), and *Baki-n-rusa*, means simply "the river." The principal head-water rises on the slopes of mount Loma, a peak of the Kong mountains, in a barren, desolate, and treeless region, in lat. 9° 25′ n., long. 9° 45′ w., about 1,600 ft. above sea-level. It flows n.e. to Timbuktu, where it bends eastward, and after flowing in that direction for about 250 m., it curves toward the s., and proceeds in a general s.s.e. course, until arriving at the head of its delta, in lat. about 5° 30′ n., it separates into many branches, and enters the gulf of Guinea, between the bights of Benin and Biafra. It is called the Timbri for the first 70 m. of its course, after which it receives the name of the Joliba, or more correctly Dhiúlibá; and after passing Timbuktu, it is known principally as the Quorra. Little is known of its course until it reaches Sego (lat. 12° 30′ n.), a distance of 350 m. from its source, but from that point it has been explored throughout nearly the whole of its course. From Sego to Timbuktu it flows through a fertile country, producing rice, maize, and vegetables, and abounding in good pasturage. In lat. 14° 10′ n., the river separates into two branches; the western is called the Joliba or Mayo, the eastern the Bara-Isa. These, as they proceed, are known as the White and Black rivers respectively; and they unite after inclosing the island of Jimballa, 220 m. in length, and from 2 to 20 m. in breadth The river again bifurcates before arriving at Timbuktu, and after passing that town, the two branches, on one of which—the northern—Cabra, the port of Timbuktu is situated, again unite. In the district of union in the s.w. of Timbuktu, the country far and wide is intersected by numberless streams, forming a complicated net-work of water-courses. The river then flows e., sending off many creeks and branches to Bamba; its banks here are low and marshy, and during the rainy season are overflowed. In this region, rice, tobacco, wheat, and even barley are grown. The river then passes the town of Burrum, where it curves to the s.e., and from this point—called from the bend, the *Knee of Burrum*—it bears the name of Kwara or Quorra until it reaches the delta. Immediately below *Burrum*, the Niger does not present an imposing appearance. Its bed resembles a broad marshy valley, inclosed by ridges of rock or high dunes, thickly overgrown with reeds and sedges, and cut up by numberless streams and creeks. At the ferry of Burri (lat. 15° 55′ n.), the breadth of the river is from 800 to 900 yards; and here the whole valley, about 10 m. broad, is fruitful, carefully cultivated, and well peopled. Further s., the towns of Garu and Sandu are passed, and here the bed is rocky and the navigation dangerous. At the town of Say, the Niger, after reaching a breath of from 2,500 to 3,000 paces, is narrowed to a width of 1,000 paces, flows at the rate of three miles an hour, and is inclosed by rocky banks. From Say to Wara, the course of the Niger remains still unknown. From Wara it flows e.s.e. to Rabba; and from this town to its mouth, the course of the river is comparatively well known. In lat. between 8° and 7° 30′ n., it flows round the eastern shoulder of the Kong mountains (2,000 to 3,000 ft. high), and here the banks of the Niger are extraordinarily beautiful. In lat. 7° 40′ n., it receives the Benne from the e. The delta consists of an immense mangrove forest, cut up into islands by the numerous branches (22 in number) of the river. The principal mouths are the Bonny, Mari, and Nun.

The existence of the Niger seems to have been first made known in ancient times by travelers from the s. shores of the Mediterranean, who, crossing the great desert, came upon the upper course of a great river flowing toward the rising sun. This river Herodotus supposed to be a branch of the Egyptian Nile. Pliny speaks of the *Nigris* of Ethiopia, but he also thought that it flowed into the Nile. No definite notion on the river had been formed until it was visited by Mungo Park in July, 1796, when this traveler explored its banks for a distance of 160 m. See PARK, MUNGO. Caillié explored the river from the town of Jennee to Timbuktu; and the English expedition of 1832, under Lander and Allen, proved that the Quorra was navigable from Boussa to the sea; information, however, which was obtained at an immense cost of human life from the unhealthiness of the climate. Subsequent expeditins have ended with similar results. In 1864, Dr. Barth followed the course of the river from Timbuktu to Say, and much of what is now known about the Niger is due to his labors. The entire length of the river is estimated at upwards of 2,500 miles.—Barth's *Travels in Central Africa*.

NIGHT-HAWK, *Chordeiles Virginianus*, a bird of the goatsucker family (*caprimulgidæ*) very common in America, from the Arctic islands to the West Indies. It is a bird of passage, visiting the north in summer. It is about nine inches in length, and 23 inches in expanse of wing. The gape is destitute of bristles. The tail is slightly forked. The general color is brown, but it is much mottled and marked with white; and there is a white mark on the throat, in shape like the letter V. The night-hawk is seen pursuing its insect prey in the air, chiefly before sunset, and before dawn, and attracts attention by its rapid repetition of a sharp impatient cry, which has gained for it the name *Piramidig*. It produces also in its flight a remarkable hollow booming sound, "like blowing into the bung-hole of a barrel," in the moments of its perpendicular descent through the air. Its movements in the air are extremely beautiful and rapid. When fat and plump, as it usually is on its southward migration, it is esteemed for the table, and great numbers are shot

NIGHT HERON, *Nycticorax*, a genus of *ardeidæ* (See HERON), intermediate in form between bitterns and herons, but with shorter and thicker bill than either, and legs shorter than in herons. The COMMON Night Heron (*N. Gardeni* or *Europæus*) is found in Europe, Asia, Africa, and North America, chiefly in the warmer temperate regions. It is most abundant in America, and is partly a bird of passage. It is a very rare visitant of Britain. Its length, from the tip of the bill to the end of the short tail, is fully two feet. It weighs nearly two pounds. Its plumage is soft, the general color ash-gray, passing into black on the neck and head, and into white on the breast and belly. The back of the head is adorned with three very long white feathers, which hang down on the neck. The nests are built in trees, and in general many together, forming a *heronry*. The night heron feeds chiefly by twilight or at night; and is never seen standing motionless, like herons, but walks about in search of prey, by the sides of ditches, ponds, etc.; its food consisting chiefly of fishes, frogs, and other aquatic animals. Its cry is very loud and hoarse.—Other species of night heron are found in Africa and Australia.

NIGHTINGALE, *Philomela*, a genus of birds of the family *sylviadæ*, approaching in character to the *merulidæ*, the young having their first plumage mottled, as in the thrushes, and the legs being longer than in the fauvettes and other *sylviadæ*, with which they are commonly classed. The bill is straight, slender, not quite as long as the head; the wings do not much pass beyond the base of the tail; the first quill is very short, the third is the longest; the tail is slightly rounded.—The COMMON NIGHTINGALE (*P. luscinia*) is well known as the finest of songsters. It is rather larger than the hedge-sparrow, with about the same proportionate length of wings and tail. It is of a rich brown color above, the rump and tail reddish, the lower parts grayish-white. The sexes are alike. It is a native of many parts of Europe and Asia, and of the north of Africa; and is a bird of passage, extending its summer migrations in the continent of Europe as far north as the south of Sweden, but in Britain it has scarcely ever been seen further north than Yorkshire. It is plentiful in some parts of the south and east of England, but does not extend to the western counties, and never appears in Ireland. It frequents thickets and hedges, and low damp meadows near streams. The extensive market-gardens near London are among its favorite haunts. It feeds very much on caterpillars and other larvæ. It arrives in England about the middle of April, the males ten or fourteen days before the females. It is at this season, and before pairing has taken place, that bird-catchers generally procure nightingales for cage-birds, as they then become easily reconciled to confinement, whilst, if taken after pairing, they fret and pine till they die. The nightingale makes its nest generally on the ground, but sometimes on a low fork of a bush. The nest is loosely constructed of dead leaves, rushes, and stalks of grass, with a lining of fibrous roots. The eggs are four or five in number, of a uniform olive-brown. The song of the male ceases to be heard as soon as incubation is over. In captivity, however, it is often continued through a more considerable period. The nightingale usually begins its song in the evening, and sings with brief intervals throughout the night. The variety, loudness, and richness of its notes are equally extraordinary; and its long quivering strains are full of plaintiveness as well as of passionate ecstasy. The nightingale has been a favorite from most ancient times; and is often mentioned in the poetry of India and Persia, as well as of Greece and Rome. The loves of the nightingale and the rose are a fanciful theme in which eastern poets delight. The nightingale much resembles the redbreast in manners, and is equally pugnacious. It has been known to breed with the redbreast in captivity.—There is another and rather larger species of nightingale in the east of Europe, faintly mottled on the breast.

NIGHTINGALE, FLORENCE, famed for her labors in reforming the sanitary condition of the British army, is the daughter of William Shore Nightingale of Embly park, Hampshire, and Leigh Hurst, Derbyshire, and was born at Florence in 1823. Highly educated, and brilliantly accomplished, she early exhibited an intense devotion to the alleviation of suffering, which, in 1844, led her to give attention to the condition of hospitals. She visited and inspected civil and military hospitals all over Europe; studied with the sisters of charity in Paris the system of nursing and management carried out in the hospitals of that city; and, in 1851, went into training as a nurse in the institution of Protestant deaconesses at Kaiserswerth, on the Rhine. On her return to England, she put into thorough working order the sanitorium for governesses in connection with the London institution. Ten years was the term of apprenticeship thus served in preparation for the work of her life. In the spring of 1854 war was declared with Russia and a British army of 25,000 men sailed to the east. Alma was fought Sept. 20, and the wounded from the battle were sent down to the hospitals prepared for their reception on the banks of the Bosporus. These hospitals were soon crowded with sick and wounded, and their unhealthy condition became apparent in a rate of mortality to which the casualties of the fiercest battle were as nothing. In this crisis Miss Nightingale offered to go out and organize a nursing department at Scutari. The late lord Herbert, then at the war-office, gladly accepted, and within a week from the date of the offer—viz., Oct. 21—she departed with her nurses. She arrived at Constantinople Nov. 4, the eve of Inkermann—the beginning of the terrible winter campaign—in time to receive the wounded from that second battle into wards already filled with 2,300 patients. Her devotion to the sufferers can never be forgotten. She has stood twenty hours at a stretch, in order to see them provided with accommodation and all the requisites of their condition. But she saw clearly in the bad sanitary arrangements of the hospitals the causes of their frightful mortality, and her incessant labor was devoted to the removal of these causes, as well as to the mitigation of their effects. In the spring of 1855, while in the Crimea organizing the nursing-departments of the camp-hospitals, she was prostrated with fever, the result of unintermitting toil and anxiety; yet she refused to leave her post, and on her recovery remained at Scutari till Turkey was evacuated by the British, July 28, 1856. She, to whom many a soldier owes his life and health, had expended her own health in the physical and mental strain to which she had subjected herself. It is known that for years Miss Nightingale has been an invalid. It is not so well known that her sick-room has been the scene of the most arduous and constant labor for the improvement of the health of the soldier. In 1857 she furnished the "commissioners appointed to inquire into the regulations affecting the sanitary condition of the British army" with a paper of written evidence, in which she impresses, with the force and clearness which distinguish her mind, the great lesson of the Crimean war, which she characterizes as a sanitary experiment on a colossal scale. Her experience in the Crimea, the results obtained by the labors of the sanitary commission, results accumulated under her own eyes, showing that the rate of mortality among soldiers could be reduced to one-half of what it was in time of peace at home, turned the attention of Miss Nightingale to the general question of army sanitary reform, and first to that of army hospitals. In 1858 she contributed two papers to the national association for the promotion of social science, on hospital construction and arrangements, afterwards published, along with her evidence before the commissioners, by J. W. Parker and son. The *Notes on Hospitals*, from their clearness of arrangement and minuteness of detail, are most valuable to the architect, the engineer, and the medical officer. In 1858 she published her *Notes on Nursing*, a little volume which is already among the treasured text-books of many a household. At the close of the Crimean war a fund was subscribed for the purpose of enabling her to form an institution for the training of nurses. The interest of the fund amounts to £1400 per annum; and though no separate institution has been formed, it is spent in training a superior order of nurses in connection with St. Thomas's and King's college hospitals. In the year 1863 was issued the report of the commission on the sanitary condition of the army in India. The complete report, with evidence, occupies two folio volumes of nearly 1000 pages each. The second of these huge folios is filled with reports from every station in India, occupied by British and native troops. These reports were sent in manuscript to Miss Nightingale, and at page 347 of vol. i. are inserted her observations upon this immense mass of evidence. In these observations, the facts are brought together in an order, and with an incisive force of statement, which render it one of the most remarkable public papers ever penned. That report is likely to inaugurate a new era in the government of India; for the views of Miss Nightingale extend not only to the sanitary reform of the British army, but to that of the towns of India. In 1871 Miss Nightingale published *Notes on Lying-in-Institutions, together with a proposal for organizing an Institution for training Midwives and Midwifery Nurses;* in 1878, *Life or Death in India*, and (in *Fraser's Magazine*) "A 'Note' of interrogation," which attracted a good deal of attention, mainly on account of the way she handles religious beliefs and life.

NIGHT-JAR. See GOATSUCKER.

NIGHTMARE, *Incubus, Ephialtes,* consists in a horrible dream, the terror being inspired by a sense of weight or oppression referred to the pressure of mountains, giants, hags, serpents, upon the breast. It is attributed to acceleration or irregularity of the circulation in the chest or in the brain. It has been traced backward to plethora, posture, heavy suppers; and forward as a prognostic of heart disease or hydrothorax. It differs from ordinary dreams in possessing always the same characteristic of fear of some object in contact with the body, in a recognized inability to move or speak while there is a strong desire to do both, and in the presence of a semi-consciousness of the real source of the apprehension. The affection is recorded to have been epidemic; and modern instances have occurred where large communities have been agitated by night panics. A regiment of French soldiers, quartered in a ruined monastery, were awakened, at the same hour in two successive nights, by a black dog leaping on the breast of each. These veteran warriors, inured to danger, inaccessible to superstition, could not be prevailed upon to make a third trial. Such frightful impressions occur during the day, and during mere somnolency or drowsiness, but more generally at the moment of awakening during the night. The time, the distinct recollection retained of the circumstance, and the bodily perturbation which remained when consciousness was re-established, all conspired to convert these visions into the objective hobgoblins, the omens and supernatural revelations of past ages; and which still linger as matter of belief where the temperament or situation of the individual resembles those of our ancestors. In a very large number of instances such dreams represent, or are continuations of, the previous waking thoughts and emotions. They are so far voluntary that indigestible food or excess may induce them. Fuseli, for artistic purposes, created "chimeras dire" in sleep by supping on pork chops.

NIGHTSHADE, the English name of certain plants of the natural order *solanaceæ* (q.v.), possessing the narcotic properties frequently developed in that order. Among them are some species of *solanum* (q.v.), particularly the COMMON NIGHTSHADE, or BLACK NIGHTSHADE (*S. nigrum*), an annual or biennial, with erect angular stem, ovate, sinuate-dentate leaves, drooping lateral umbels of white flowers, and globose black berries; a frequent weed in waste places in England and in most parts of the world. Few plants are more widely diffused. It is only slightly narcotic. The leaves, in a fresh state, are said to be injurious to animals which eat them, but seem to lose almost all narcotic property by boiling, and are used as spinach, particularly in warm climates. The berries, although generally dreaded or suspected, may also, it is said, be eaten, at least in moderate quantity, without danger. They contain, however, the alkaloid *solanine* found also in the shoots of the potato.—WOODY NIGHTSHADE, see BITTERSWEET. For DEADLY NIGHTSHADE, see BELLADONNA. For ENCHANTER'S NIGHTSHADE, see CIRCÆA.

NIGRITIA. See SUDAN, *ante*.

NI'HILISM is a term used of certain philosophical or half-philosophical systems of "negative" tendency, especially such as deny God, the soul, and the moral distinction between good and evil. Of late, however, it has become familiar throughout Europe as applied to the hyper-revolutionary programme of a Russian organization in various ranks of society. The young men at the universities seem to be largely addicted to Nihilism, and are equaled in their zeal by the "fair girl graduates" of Russia. The Nihilists are said to have adopted many of the socialistic views of Proudhon (q.v): but while their scheme is in other respects vague and ill-compacted, their foremost principle is the belief that society may be and ought to be regenerated by a sudden and sweeping overthrow of most existing social and political institutions. Towards preparation for this extensive undertaking, their bold propagandism is especially directed. While violently opposed to Pan-slavism (q.v.) as supporting old and obsolete notions of nationality and patriotism, cosmopolitan Nihilism is yet so far purely Russian as apparently not to have established direct relations with the socialistic organizations of western Europe. Herzen (q.v.), as an admirer of west European culture, widely to be distinguished from the Nihilists, gave a powerful impetus to the spread of democratic opinions in Russia. But the great leaders of the Nihilistic movement were the indefatigable agitator Michael Bakunin (born 1814) and the journalist Tchernyschevski. In 1869, during certain students' demonstrations, revolutionary manifestoes were distributed. Much was done for promoting revolutionary opinions through the medium of Sunday-schools, ere these were suppressed by government. Young men of good birth adopted menial callings in order to understand the grievances and burdens of their poorer brethren, and to enter with fuller sympathy into their feelings. Nihilistic associations began to display organized activity, and considerable funds were collected. Government now began numerous prosecutions. In 1871 there was a lengthened trial, and numerous condemnations to Siberian exile. In 1875 an actual rising took place under a red banner, amongst the students at Kazan. In 1877 139 persons, mostly young men and women, were tried, and many condemned. The unanimous acquittal by a St. Petersburg jury of the lady assassin, Vera Sassulitch, who attempted the life of gen. Trepoff, governor of a prison, displayed a dangerous condition of public feeling, and led to the significant, though "temporary," withdrawal of the trials for political crimes from juries, these being now assigned, to courts-martial. The assassination, by Nihilists especially commissioned, of the general at the head of the secret police of Russia and of the governor of Kharkov, in 1878 and 1879, show the boldness and persistency of the Nihilistic propaganda.

NIHILISTS (from Latin *nihil*, "nothing"), a revolutionary organization in Russia, aiming at the destruction of all existing laws, religions, and political and social systems, while preparing to replace them with nothing. It is stated that the term was first employed by the Russian novelist, Ivan Turgenieff, in his stories of Russian society. It was, however, accepted by the organization itself, as will appear in the following quotation from a speech by a member, and which may be accepted as fairly significant of the doctrines with which the minds of the advanced radicals of Russia have become imbued. "Nothing, in the present state of social organization, can be worth much, for the simple reason that our ancestors instituted it. If we are still obliged to confess ourselves ignorant of the exact medium between good and evil, how could our ancestors, less enlightened than we, know it? A German philosopher has said: 'Every law is of use. It rules the conduct of individuals who feel for one another and appreciate their respective wants. Every religion, on the other hand, is useless; for ruling, as it does, our relations with an incommensurable and indefinite Being, it can be the result only of a great terror or else of a fantastic imagination.' Now, we Nihilists say, no law, no religion—nihil! The very men who instituted these laws ruling their fellow-creatures have lived and died in complete ignorance of the value of their own acts, and without knowing in the least how they had accomplished the mission traced for them by destiny at the moment of their birth. Even taking it for granted that our ancestors were competent to order the acts of their fellow creatures, does it necessarily follow that the requirements of their time are similar to those of to-day? Evidently not. Let us then, cast off this garment of law, for it has not been made according to our measure, and it impedes our free movements. Hither with the axe, and let us demolish everything. Those who come after us will know how to rebuild an edifice quite as solid as that which we now feel trembling over our heads." Two points will be observed in this manifesto: the one being its positive antagonism to all existing things—because they exist; the other the sophistry with which the accepted position is reasoned out to a logical conclusion. And this brings us naturally to the starting points of Russian nihilism: in the influence of the Russian history; in the nature of the Russian people; and in the exceptional character of the Russian political system.

The present autocracy of Russia was originally an oligarchy, and not until Ivan I. (III.) founded the existing Russian empire in the 15th c. was the power of the grand-dukes, true oligarchs, destroyed. Autocracy was cemented by his immediate descendant, Ivan the terrible, by Peter I., Katherine II., and finally by Nicholas. Under the changed political condition instituted by these monarchs, there came to be but three orders or classes among the Russian people: the czar, the nobility and aristocracy, and the serfs: there was no *bourgeoisie* or middle class. This anomalous condition is supplemented by another; the existence for centuries of the *mir*, an actual democracy, which has outlived tyranny and spoliation, and by which each village community has kept alive the ideas of socialism and equal rights. The *mir* is in fact a co-operative association of the local peasantry, under a head elected by themselves, who exercises parental authority in conjunction with the village parliament which is convened in cases of emergency. This institution is primitive in its origin, which was Slavonic, is patriarchal in discipline, and preservative of the socialistic element in rural economy. Through its means exists the veritable commune in Russia; since the arable land and pasturage belong not to individuals, but are the collective property of the commune, which enjoys unlimited authority in making allotments and in the redistribution of the soil. These village communes contain about five-sixths of the population, and are opposed to Cæsarian despotism on the one hand, and centralized bureaucracy on the other. When to this extraordinary combination of factors is added that of the persistent tendency of the Russian aristocracy toward anarchy—which is a historical fact—it will be seen what a readiness there is for socialistic ideas and positive revolutionary principles. After Ivan the terrible, a period of actual anarchy existed in Russia, when the boiars (barons) succeeded in fastening still more strongly the chains of servitude upon the unhappy serfs. The accession of Michael Romanoff to the throne, and the foundation of a new dynasty, proved to be the death-blow to their hopes for ascendency in the realm, and there was nothing for them, and for all the petty potentates and government officials in the empire, but to continue an iron grasp on the lower order, for the increase of their wealth and power, if not of their dignity. A reviewer in *Blackwood* has epitomized the situation: "We have the monarch who rules, the courtiers who assassinate, and the serfs who obey." And Mr. Gladstone wrote, so late as 1880, of what he called "the oligarchic, diplomatic, and military class:" "This class, or rather this conglomerate of classes, ever watchful for its aims, ubiquitous yet organized, standing everywhere between the emperor and the people, and oftentimes too strong for both, is at work day and night to impress its own character upon Russian policy." Under Ivan the terrible was organized the opritchini (elect, or covenanted), a body of guards, selected sometimes from the lowest of the people, who swore implicit obedience to the czar, and in return were chartered libertines, robbers, and assassins. Each of them exercised a despotism as odious in its sphere as that of the czar, and they became the nucleus of a new kind of nobility, the nobility of function and government employ, which for all practical purposes nearly superseded the hereditary nobility. It is to be remembered that Nicholas ascended the throne over the ruins of a conspiracy which only his personal majesty and invincible courage enabled him to control; and this by such a massacre of those engaged in the uprising, that in one day 15,000 persons were slain, whose bodies were thrown by torchlight into the Neva. But before the accession of Nicholas, in 1821, when all Europe was convulsed with revolutionary disorder, Russia began to feel the influence of the new ideas which pervaded the political atmosphere of the entire continent, and did not escape the infection of secret societies which had been brought back by the armies from France. It is not unreasonable to suppose that it was this influence which brought about the insurrection of Dec., 1825; since one of the leaders in the outbreak was Alexander Hertzen, who with Bakunin, is considered a founder of the nihilist organization; and who continued throughout his life (he died in 1870) to disseminate the most advanced radical opinions. As an illustration of the tendency of his writings, we have the following: "Despotism itself lives behind wooden walls, and has no stability. A conservative government like that of Austria has never been possible in Russia; we have nothing to conserve, because there is nothing stable among us. . . . . Every government brings into question existing rights and institutions; what was ordered yesterday is countermanded to-day. Because there is no historical basis, we love novelties to distraction."

Alexander II. ascended the throne under circumstances which, though less sanguinary than those of his father's accession, were yet essentially untoward. Apparently everything was in ruins: the military system had broken down; the Crimean war had been a disaster; the administrative machinery of the state had almost collapsed. In closing the Crimean war, the new emperor uttered a manifesto which was significant of his hopes and designs for the future of Russia. Among other expressions in it was the desire that "by the combined efforts of the government and the people, the public administration would be improved, and that justice and mercy would reign in the courts of law." The beginning of his reign was signalized by the copious use of the pardoning power; and in its second year he began to move in his vast enterprise of emancipating the serfs, by submitting the question to the nobles of the empire. The number of serf-owners in Russia was about 110,000, having under their control 23,000,000 peasants. In 1857 the emperor issued a ukase which was the beginning of the tremendous change which he had undertaken; and on Feb. 19 (March 3, N.S.), the emancipation law was completed, and the signature of Alexander II. gave freedom to 23,000,000 men. By the agrarian, or land law, which followed, the peasants of a commune were enabled to buy their holdings by a cash payment of about three years' rent, the state advancing four-fifths of the full payment, which was to be repaid, with 6 per cent interest, in 49 years. In the outset, under this act, Russia paid $500,000,000 to the landlords to settle the newly emancipated serfs upon their own holdings, comprising farms extending over 300,000,000 acres. And as the peasants, from time to time, failed to meet their payments, the government advanced the amount. The final result of the land-law will be that the peasant, by paying four-fifths of his rent for 49 years to the state instead of to his landlord, will, at the expiration of that period, have become absolute owner of his farm. It is to be observed that by the enforcement of the emancipation act and the land act, the landlords lost first, their serfs, and then 20 per cent of their rentals. The third great act of Alexander II., was to extend the system of the *mir*, or local self-government, so as to give the peasants entire control as to this, with a very complete organization of elected officials. As the emperor also reformed the judiciary; introduced trial by jury, and the system of trials in open court; made decided improvements in the public administration of offices; promoted education, so that between 1860 and 1870 the number of children who could read multiplied five-fold; and finally destroyed most of the existing class distinctions, and relaxed the severity of the censorship of the press; the continued existence of nihilism, and its potency, as shown in the recent assassination of this very czar, present a most difficult social and political question. The anomaly of the union of many of the wealthiest and most aristocratic Russians, men and women, with students and other educated persons, with the peasant class, in a wide revolutionary movement, having for its avowed object the destruction of all existing institutions, would be inexplicable, but for the peculiar characteristics of Russian history—as already set forth; with other reasons now to be indicated. Mr. Gladstone has said of Alexander II.: "The present emperor of Russia has, during a reign now approaching a quarter of a century, given ample evidence of a just and philanthropic mind. No greater triumph of peaceful legislation is anywhere recorded than the emancipation of the Russian serfs which he has effected." Of these very serfs, or peasants, he has said: "They are a peaceful and a submissive race, whose courage in the field is that of a determined and uncalculating obedience.' '

We have referred, as one of the starting points of Russian nihilism, to the nature of the Russian people. This is not what has been generally supposed, particularly by Americans, who have received their conclusions ready-made from always antagonistic and contemptuous English sources—to whose utterances those of Mr. Gladstone stand as a relief. The current opinion as to the result of "scratching a Russian," derived from the emperor Napoleon I., who had no great cause to love the race, has been that this would be to disturb the Tartar savage beneath, and bring to light a disposition cruel, vindictive, and stubborn; and a temperament stolid and lethargic; a combination of the merciless Asiatic, and the boorish and, phlegmatic Hollander of the picture-books. This conception is far from truth. The race is probably similar to the Irish in some characteristics; and to the French in its mercurial nature; while in strange combination it resembles the German in its fondness for abstract philosophical reasoning, and the Spaniard or Italian in its sensuousness and indolence. These latter characteristics give it an oriental stamp. As to the psychological tendencies of the Slave mind, Moritz Kaufmann writes that it is "singularly sensitive to the seductive influences of grand misty conceptions, while at the same time inclined to indolence and melancholy dejection"—again an oriental tinge. Keeping in view this fact; and remembering that in Russia there has been for centuries a struggle between the educated (aristocratic) class and the emperor; that while the individual administration of the government by the latter may have been excellent; that of his officials, from the highest to the lowest, has, confessedly, been infamous; that vast reforms were projected into the Russian system *en masse*, which elsewhere would have been the slow work of centuries; that these reforms, while they alienated from the emperor and autocracy the favor of the upper class, did not gain that of the lower; it may well appear that Russia needed only to be infused with an element powerful enough and insidious enough, to become distracted into any madness. The tendency of the emancipation act and the land act, however noble and beneficent these were in themselves, has been to undermine the confidence of the Russian peasant, by removing from him the only sure foothold that he knew. As the prisoner, long confined, pleads to return to his dungeon, the serf under his new condition of freedom, combined with that of proprietorship, is prostrated beneath an endowment which is an actual burden. For the peasant has to a certain extent merely changed owners—since as to his payments for land, he is obliged to depend on some principal man in the village. And, meanwhile, the old commune principle is being slowly eaten away, and that of *individualism* with its consequent responsibilities and antagonisms—both utterly foreign to the experience and taste of the Russian peasant—assumes its place.

Michael Bakunin, supposed by some to have formulated nihilism out of the Hegelian philosophy, but whose theories are more naturally traceable to an utter materialism acting on the revolutionary ideas afloat in Europe during the first half of the 19th c., was born in 1814, and died in 1876. He was of a family high in rank and position, a near relative being aid-de-camp general to the late czar, and another governor-general of e. Siberia; was educated in the school for cadets in St. Petersburg; and on graduating was appointed an ensign in the artillery. In 1841 he went to Berlin and studied Hegel, where the master had taught a dozen years before; removing afterwards to Dresden, where he continued his studies with Arnold Ruge, and where he began to write on philosophical subjects. In 1843 he was in Paris, and by this time had become closely associated with the Polish refugees; and from there he visited Switzerland, where he was introduced into the communist and socialist societies. In 1847, in a speech made in Paris, he advocated a general Russian and Polish uprising against the emperor; this occasioned a request from the Russian government which procured his expulsion from France. A reward of 10,000 rubles was offered by the Russian government for his apprehension, and he fled to Brussels, but returned to Paris after the revolution in 1848. He attended the Slavic congress at Prague, and was involved in the revolutionary movement which followed; was one of the organizers and leaders of the riots in Dresden, from which city he fled after their suppression; and on May 10 was captured at Chemnitz. He was now tried, condemned, and sentenced to death in three countries—Prussia, Austria, and Russia; his punishment being in each instance commuted to that of imprisonment for life. He was confined for several years in the fortress of St. Petersburg, and then transported to e. Siberia, where he remained for several more years as a penal colonist, when he was permitted to settle in the Russian territory of the Amoor. Thence escaping by an American vessel, he proceeded by way of Japan and California to London. Here he was active in endeavors to incite the Russians and Poles to revolution, with the view of forming a great Slavic federal republic. In 1863 he went to Stockholm to aid the expeditions against the Baltic provinces. This enterprise failing, he proceeded to Switzerland, where he united with the internationals; but his attempt to create a secret society within their own, with the purpose of bringing about a condition of general anarchy, brought him into conflict with their leaders; and in 1872 he, with some of his friends, was expelled from the organization, when he retired from public action. In the meantime societies had been formed in Russia to promote the views of Bakunin and Hertzen, the "Young Russia," "Land and Freedom," etc.; and newspaper organs—the *Sovremiennik* and *Ruskoie Slowo*, were established and industriously circulated in the same interest. As presenting the strangely self-contradictory theories which dominated the new revolutionary order at this time, the following is quoted from a speech made at Geneva, in 1868, by Michael Bakunin—"the father of nihilism, the arch-conspirator:" "Brethren, I come to announce to you a new gospel which must penetrate unto the very ends of the world. This gospel admits of no half-measures and hesitations. The old world must be destroyed and replaced by a new one. The *lie* must be stamped out and give way to truth. It is our mission to destroy the *lie;* and to effect this we must begin at the very commencement. Now the beginning of all those lies which have ground down this poor world in slavery is God. For many hundred years monarchs and priests have inoculated the hearts and minds of mankind with this notion of a God ruling over the world. They have also invented for the people the notion of another world, in which their God is to punish with eternal torture those who have refused to obey their degrading laws here on earth. This God is nothing but the personification of absolute tyranny, and has been invented with a view of either frightening or alluring nine-tenths of the human race into submission to the remaining tenth. If there were really a God, surely he would use that lightning which he holds in his hand to destroy those thrones to the steps of which mankind is chained. He would, assuredly, use it to overthrow those altars where the truth is hidden by clouds of lying incense. Tear out of your hearts the belief in the existence of God; for as long as an atom of that silly superstition remains in your minds, you will never know what freedom is. When you have got rid of the belief in this priest-begotten God, and when, moreover, you are convinced that your existence and that of the surrounding world are due to the conglomeration of atoms, in accordance with the laws of gravity and attraction, then, and then only, you will have accomplished the first step toward liberty, and you will experience less difficulty in ridding your minds of that second lie which tyranny has invented. The first lie is *God.* The second lie is *right.* *Might* invented the fiction of right, in order to insure and strengthen her reign—that right which she herself does not heed, and which only serves as a barrier against any attacks which may be made by the trembling and stupid masses of mankind. *Might,* my friends, forms the sole groundwork of society. Might makes and unmakes laws, and that might should be in the hands of the majority. It should be in the possession of those nine-tenths of the human race whose immense power has been rendered subservient to the remaining tenth by means of that lying fiction of *right* before which you are accustomed to bow your heads and to drop your arms. Once penetrated with a clear conviction of your own *might*, you will be able to destroy this mere notion of *right*. And when you have freed your mind from the fear of a God, and from that childish respect for the friction of *right*, then all the remaining chains which bind you, and which are called science, civilization, property, marriage, morality, and justice, will snap asunder like threads. Let your own happiness be your only law. But in order to get this law recognized, and to bring about the proper relations which should exist between the majority and minority of mankind, you must destroy everything which exists in the shape of state or social organization. So educate yourselves and your children that, when the great moment for constituting the new world arrives, your eyes may not be blinded by the falsehoods of the tyrants of throne and altar. Our first work must be destruction and annihilation of everything as it now exists. You must accustom yourselves to destroy everything, the good with the bad; for if but an atom of this old world remains, the new will never be created. According to the priests' fables, in days of old a deluge destroyed all mankind; but their God specially saved Noah in order that the seeds of tyranny and falsehood might be perpetuated in the new world. When you once begin your work of destruction, and when the floods of enslaved masses of the people rise and engulf temples and palaces, then take heed that no ark be allowed to rescue any atom of this old world, which we consecrate to destruction."

Here, the very "right" whose existence is denied is invoked as the basis of action. In one nihilist speech it is asserted that the deeds of political assassins and incendiaries are not the offspring of any sentiment of personal hatred or vengeance. They know full well that one emperor killed will merely be succeeded by another, who in his turn will again nominate the chiefs of police and of the third section. Such deeds are justified by the necessity of rooting out from men's minds the habitual respect for the powers that be. The more the attacks on the czar and his officials increased, the more would the people come to understand the absurdity of the veneration with which they have been regarded for centuries. In March, 1876, several nihilist proclamations on their way to Russia were seized by the Prussian authorities at Königsberg. Paragraph xvi. of one of the documents ran thus: "You should allow yourselves to be influenced (in the selection of your victims) only by the relative use which the revolution would derive from the death of any particular person. In the foremost rank of such cases stand those people who are most dangerous and injurious to our organization, and whose sudden and violent death would have the effect of terrifying the government, and shaking its power by robbing it of energetic and intelligent servants. § xxiii.—The only revolution which can remedy the ills of the people is that which will tear up every notion of government by its very roots, and which will upset all ranks of the Russian empire, with all their traditions. § xxiv.—Having this object in view, the revolutionary committee does not propose to subject the people to any directing organization. The future order of things will doubtless originate with the people themselves; but we must leave that to future generations. Our mission is only one of universal, relentless, and terror-striking destruction. § xxvi.—The object of our organization and of our conspiracy is to concentrate all the forces of this world into an invisible and all-destroying power." Among the papers found on the nihilist lieut. Dubrowin, who was hanged for complicity with the regicide Solowjew, was a letter containing the following passage: "Our battalions are numerically so weak, and our enemies, on the other hand, are so mighty, that we are morally justified in making use of all attainable methods of proceeding which may enable us to carry on successfully active hostilities wheresoever it may become expedient." Again, the inevitable attempt at justification on the basis of the "right" whose existence is denied.

When one reads such propositions and declarations, and finds it difficult to conceive a sufficient reason for the existence of the sentiments and determination expressed, even in the most untutored and illy balanced, it is to be remembered that in Russia any tendency toward revolutionary expression has ever been met with instant and severe punishment. The knout and perpetual banishment at hard labor have been the modes in which autocracy has visited its displeasure on any movement against itself. While the czar of his own suggestion gave freedom and large actual possessions to 23,000,000 of his poorest and most unhappy subjects, he followed the traditions of the throne of Russia by sternly refusing to the higher classes anything resembling a constitution, or a national legislature. Attempts to gain these, and there were many such, served to people the penal colony of Siberia, precisely as did the more savage and mutinous attempts of the lower order in a similar direction. During many years the average number dispatched to Siberia, for all offenses, has been from 8,000 to 10,000 persons per annum; and of these, probably a large majority were for political crimes; very many of them educated, wealthy, and of high birth; among them not a few refined, cultivated, and gentle ladies. Siberia has the reputation among Russians of being a much worse place than it really is, and the officials in charge of the convicts are accused of a general line of cruelties which is foreign to their customary behavior. Recent visits to the Siberian penal settlements by intelligent travelers of different nationalities, have shown that the ill-treatment of convicts and the dismal character of existence in Siberia have been greatly exaggerated, and that both compare favorably with those in such settlements elsewhere. But to the prevailing Russian belief as to such matters may be laid somewhat of the revengeful and desperate frame of mind which results in nihilism. Again, the slight allusion which has been here made to the course pursued by government officials in Russia, has in no wise fully presented the enormities committed by these wretches in the name and by the authority of the emperor, who could not possibly control or even direct in such instances. The outrages and brutalities committed by agents of the government in distant parts of the empire, were done in perfect security, and went unpunished. It was hardly to be wondered at that the rude and illiterate Russian peasant, robbed of all that he held most dear, by the highest government official in his neighborhood, should accept from the learned the proposition that there was no God. Neither should it appear so astonishing that the educated and cultivated Russian whose sister or sweetheart was subjected to the knout, for the expression of liberal opinions, or sent by imperial order into that Siberia of whose horrors he had heard, should view not unwillingly the possibility of a regeneration of society which began with the assassination of emperors.

After Bakunin, the one who did most to propagate nihilistic ideas in Russia, was the novelist Tschernyschewsky, who edited a radical monthly until it was suppressed in 1862, and afterward wrote *What is to be Done*, a remarkable novel, which was forbidden circulation in Russia, but was printed in Berlin and in Switzerland. Disseminated thus through broadsides, periodicals, newspapers, handbills, and even fiction, the nihilist views have found many readers. The students in the universities have been apt and eager scholars in the new dispensation, mainly on account of mal-administration of their various colleges; but also from that volatile temperament and tendency to advanced speculative opinions which generally characterizes students everywhere. An absurd rule, that a knowledge of Greek and Latin should be the test in university and civil-service examinations, drove many students from the universities and into nihilism. In Russia the only field for the young man of education who is not noble, is the civil-service: commerce, the industries, and agriculture, offer them nothing; the priesthood is despised; there is little or no business for the lawyer, and the army positions are reserved to the nobility. Thus, to make a classical education a *sine qua non* for entrance to the university, was to set up an impenetrable barrier; since the students, for the most part, are the sons of poor trades-people, priests, and small government officials, to whom Greek and Latin are impossible as preliminaries to a university education. Thrown out of their destined career, these young men had neither position, means of existence, nor prospects: and in very desperation they grasped at the delusive subleties of nihilism. There are no means of knowing the number of nihilists; the organization seems wide spread, but careful investigators incline to consider the number as comparatively very small.

There remains only to recapitulate a few of the leading events in the history of the various revolutionary attempts made by this organization since its foundation. As early as 1859 nihilistic societies began to be formed in Russia among the students of the agricultural college of Petrovski, near Moscow, who had adopted the materialistic views taught by Büchner in his *Force and Matter*, and those on socialism set forth by the German, Max Stirner in his *Property and the Individual;* and who had read also, it it said, Buckle's *History of Civilization*. It was in this institution that the first political assassination occurred, when one of the students named Ivanoff was killed by the notorious Netchaïeff, who though an emissary of Bakunin, and of the chief committee of the nihilists, is accused of having been a common swindler, while he certainly proved himself to be an informer. This assassination, which did not happen until 1873, caused intense excitement, in the midst of which the perpetrator escaped to Switzerland, but only to be given up by the Swiss to the Russian government. He was tried in Moscow in 1874 with closed doors, and would have been executed, but that on account of the information which he afforded, his sentence was commuted to transportation for life and penal servitude in the mines of Siberia. By his confessions 183 persons were implicated, and these were all seized on the same day, May 20, 1875. Their trial lasted 18 months, terminating in Dec., 1877, when 99 of the accused were sentenced to penal servitude in Siberia, 36 subjected to police supervision for a certain number of years, and the remainder acquitted; those accused were chiefly sons and daughters of priests, trades-people, Jews, and small officials, and were charged with seeking to propagate nihilism among the lower classes. Many of them were young girls. The nihilists began to attract attention as a really formidable association about the time of the trial of Vera Sassulitch in 1878. Vera Sassulitch, a young woman 28 years of age, who had been under the surveillance of the government on account of the suspicion that she was concerned with the nihilists, attempted the assassination of gen. Trepoff, one of the chief of secret police, in July, 1877. The officer in question had ordered a political prisoner to be flogged for some act of disrespect to him personally, and Vera Sassulitch, as she averred, committed the act in order to force the government to take note of the fact. She was tried by a jury of educated men, eight of whom held government positions, and to the general astonishment, was acquitted, a result with which the Russian press and public showed themselves in full agreement. Gen. Trepoff was removed from his position, but was made gen. of cavalry. Vera Sassulitch left the country after the trial in 1878, but her case was brought before the supreme court of revision, and the acquittal canceled on the ground of informality. In Aug., 1878, gen. de Mezentzoff, the successor of gen. Trepoff, was stabbed at St. Petersburg while walking, and died the same day. This and other similar attacks were ascribed to the nihilists, who were manifesting remarkable activity in all directions. A secret association called the "National Government" issued a circular in

April, 1878, containing a revolutionary programme, and calling upon the people to take up arms. Assemblages of the people in public places were now prohibited by a ministerial order. In a letter from Odessa to a Vienna newspaper, it was stated that there were several thousand members of the nihilist society in that city alone; that the organization had powerful supporters in the highest ranks of society; and that a lady who was one of the Russian fashionable leaders, had been arrested for being in correspondence with the chief of the nihilist committee at St. Petersburg. During Sept., 1878, a pamphlet entitled *Life for Life*, which was considered a manifesto of the nihilists, was published in St. Petersburg. Among other passages, it contained the following: "We are socialists. Our purpose is the destruction of the present economical organization and inequality which constitute, according to our convictions, the root of all the evils of mankind. The question of the political form is entirely indifferent to us." . . . "Our daggers will never be sheathed until our oppressors, who strangle and gag us, are expelled from the country; and a terrible vengeance will be taken if the Russian nation do not put an end to this mediæval barbarism." This declaration of socialism as a theory of governmental order, thus opposing the fundamental principle of nihilism, shows the heterogeneous elements and the blind fury of the whole movement. The assassination of gen. Mezentzoff was in fact avowed by the nihilists in their journal *Land and Liberty*, in which they alleged that he deserved death because he had trampled right under foot; had tortured his prisoners; persecuted the innocent; and in his official capacity had murdered by brutal ill-treatment, by hunger, thirst, and the rod, a number of persons whose names were given. On Feb. 22, 1879, prince Krapotchkin, governor of Kharkov, was assassinated by shooting; according to a nihilist circular, on account of certain inhuman acts against prisoners in his charge. Heyking, commander of gendarmerie at Kiev, was also among the victims of the nihilists, and on March 25, 1879, gen. Dreuteln, chief of the gendarmerie or third section, was shot at, and being missed, was warned that he could not long escape. The number and character of the persons assassinated or attacked by order of the committee of the nihilists was so great in the several towns of the empire, as to cause general alarm. The period of murders was followed by one of conflagrations. In the month of June alone, in 1879, 3,500 fires broke out in St. Petersburg, Orenburg, Koslow, Irkutsk, and Uralsk, destroying property to the amount of 12,000,000 rubles. Only 900 of these fires could be properly accounted for, and the remaining 2,600 were attributed to nihilist incendiaries. On April 2, 1879, an attempt to assassinate the emperor Alexander II. was made by Solovieff, who fired four shots at him from a revolver, but missed his aim. Solovieff was captured and afterward hanged. In Nov., 1879, an attempt was made to blow up the train by which the emperor was expected to arrive at Moscow; this attempt failed from a change of programme on the part of the emperor, who was not on the train that was actually blown up by a mine fired by one Hartman, who escaped. In 1867 an attempt had been made on the emperor's life while he was in Paris, riding in the Bois de Boulogne with the emperor Napoleon III. The assassin fired at him but missed him. The third effort was that of a man who entered the imperial apartments in disguise. The fourth, the terrible explosion at the Winter palace which killed several persons. The fifth and last occurred on the afternoon of Sunday, Mar. 13, 1881, and was a successful assassination. The emperor was returning from a parade in the Michel manege, and when near the Winter palace, a bomb was thrown beneath the imperial carriage, and exploded, breaking through the back of the vehicle, but without injuring the czar, who alighted to examine the extent of the damage. At that moment a second bomb was exploded close to his feet, shattering both his legs, and otherwise injuring him so that he died in less than two hours. The two assassins were immediately arrested, and within a few days others were apprehended for complicity in the affair. The funeral of Alexander II. took place on March 20, 1881. His son, the czarovitch, assumed the crown under the title of Alexander III. The assassination, which chilled the civilized world with horror, was openly rejoiced in at socialist meetings in various countries.

A proclamation of the executive committee of the nihilists, drawn up shortly after the attack on the emperor by the assassin Solovieff or Solowfew, sums up the latest known published demands of nihilism as follows :—"A representative democratic form of government; permanent parliaments, with full powers to regulate all matters of state; extension of self-government in the provinces; complete autonomy of rural communes; the land to be put into the possession of the people; means to be found for placing the factories in the hands of the artels or artisan guilds; transformation of the army into a militia; liberty of the press, and industrial combination." This ceases to be nihilism proper, and attempts reconstruction. It may mark a change in the direction of activity. Nihilism, too incoherent to be more than a blind frenzy, must soon destroy itself; but none can predict into what shape of revolution its fragments may be organized in some near future.

NIIGATA, a sea-port on the w. coast of Japan, at the mouth of the Shinano river, seat of the ken or prefecture of the same name, which comprises the island of Sado and the province of Echigo (6,000 sq.m; pop. 1,503,174); pop. of city, '78, 34,000. Petroleum, coal, various minerals and metals abound. The soil is good; rice, silk, tea, and the lacquer tree are cultivated. The city was founded in 1655, and opened as a port of foreign commerce by the treaties of 1858. It is well provided with schools, banks, newspapers, post-offices; and its streets, which cross each other at right angles, are lighted at night. A rich inland trade is done on pack horses; and river steamers, sea-junks, and the native coasting-steamships, make this port an active place.

NIJ'MEGEN, NI'MEGUEN, the *Noviomagum* of the Romans (*magum* or *magen* being a Celtic word for a fixed dwelling), called by Tacitus *Batavorum oppidum*, in the middle ages *Numaga*, is the principal city of the district of Nijmegen, or the Betuwe, in the Netherlands province of Gelderland. Pop. 23,503, of whom three-fourths are Roman Catholic. It it pleasantly situated, 9 m. s. of Arnheim, on the several little hills, on the left bank of the Waal. Several of the streets are steep and narrow, passing up the Hoenderberg (*Hunnerberg*, or hill of the Huns), on which the Romans had a permanent camp in order to keep in subjection the country of the Bataviers, which lay between the Rhine and the Waal; others are broad and well built. On a height stood, till 1797, when it was demolished by the French, the castle of Valkenburg, said to have been built by Julius Cæsar. Here Charlemagne built a palace, and made the castle his residence. The site is now planted with trees, and forms a pleasant public walk overlooking the river and quay. On the brow of the hill there is a little sixteen-sided chapel or baptistery, which some think was originally a heathen temple of the Bataviers, and converted into a Christian church by Pope Leo III. in 799. On another eminence, where the chateau of the duke of Alva once stood, is a modern tower called Belvidere, from the summit of which there is an extensive view, including the rivers which branch off at the delta of the Rhine—viz., the Rhine, the Waal, and the Yssel, with the Maas flowing in the south. Nijmegen is strongly fortified and well garrisoned. The town-house, founded in 1554, is beautifully and antiquely fitted up within, and externally ornamented by several statues of emperors and kings of the Romans. St. Stephen's, or the great church, standing on the highest part of the city, is a handsome Gothic edifice in the form of a Greek cross, and before the reformation contained 30 altars. Nijmegen is a large market for cattle and agricultural produce, especially grain. Beer is extensively brewed, eau de cologne distilled, and there are factories for spinning and weaving; tin goods and earthenware stoves are manufactured.

Nijmegen is celebrated for the great peace congress of the European powers which was held here, and, Aug. 10, 1678, concluded a treaty between Spain and France; on Sep. 17, between France and the United Netherlands; and between the German empire and France, and the same empire and Sweden, Feb. 5, 1679.

NIJNI-NOVGOROD, an important government in the e. of great Russia, between the governments of Vladimir on the w. and Kazan and Simbirsk on the east. Area (according to the *Almanach de Gotha*), 19,390 sq.m.; pop.'70, 1,271,564. The surface is divided into two distinct portions by the Volga with its tributary the Oka. On the left, the northern bank of the river, the surface is flat; on the right bank it is hilly. As the soil is not very fertile, and there are few rich meadow lands, neither agriculture nor cattle-breeding is pursued extensively. The inhabitants are principally engaged in manufactures. The chief rivers are the Volga, Oka, and their numerous tributaries. There is communication by water with 24 governments, and with the Baltic, the White, and the Caspian seas. The northern districts of the government abound in forests, and here wooden utensils and tools are manufactured for the adjoining governments. There are several large iron-works, and the town of Gorbatof is the Sheffield of its district. Leather, especially that variety called Russian leather, is largely manufactured, and sheep and lamb skin dressing is a staple employment. On the right bank of the Oka are several ship-building and dock yards. The towns and villages are filled with an industrious and thriving manufacturing population. Capital, Nijni-Novgorod (q.v.).

NIJNI-NOVGOROD (Lower Novgorod), a famous commercial and manufacturing t. in the e. of great Russia, capital of the government of the same name, is situated at the confluence of the Oka with the Volga, 715 m. e.s.e. of St. Petersburg. The fortified portion of the town occupies a hill overlooking the Volga, and is surrounded with a wall. It contains the kreml or citadel, 2 cathedrals, and the palaces of the governors. The manufactures of Nijni-Novgorod include cloth, leather, steel goods, wax candles, tobacco, beer, pottery, etc., and ship-building. The trade of the town is of great commercial importance, especially during the great annual fair which brings buyers and sellers from all climes between Germany and China. For the convenience of those frequenting the fairs, an enormous market-hall has been built, and sixty blocks of buildings for booths, containing 2,530 apartments separated by fire-proof walls. The numerous churches of the citizens are supplemented by a mosque and an Armenian church for the visitors. There are three annual fairs, two of them of minor account. The third, beginning at the end of July and continuing into September, is by far the greatest in the world. The normal population (44,190 in 1871) is then increased to near 350,000; and the value of the goods sold at the great fair of 1874 was about £24,000,000. Nijni-Novgorod, which is favorably situated for purposes of commerce, carries on a brisk trade during the whole season of navigation.

Nijni-Novgorod, founded in 1221, was devastated on several occasions by the Tartars; and in 1612, when it was on the point of falling a prey to Poland, Minin, the famous butcher of Nijni-Novgorod, collected an armed force here, which, under prince Pojarsky, drove the invaders from the capital. See Moscow. The prosperity of this town dates from the year 1817, when the great fair was removed to Nijni-Novgorod from Makarief, on account of the destructive fire which broke out in the latter place.

NIJNI-TAGILSK, a t. of Russia, in the government of Perm, amid the Ural mountains, 150 m. e. of Perm. It is one of the most important mining towns in Russia, or in the world. The soil in the immediate vicinity is everywhere rich in iron, copper, gold, and platina; not far off is the famous magnetic mountain Blagodat, 1422 ft. high. Akimfi Demidoff (q.v.) established the first foundry here in 1725. The yield both of iron and copper is immensely large. Pop. 35,000.

NIKKO, the seat of the mortuary shrines of Iyeyasu, and of Iyemitsu, the founder and the third of the line, respectively, of the Tokugawa family of shōguns (tycoons) who ruled Japan from 1603 to 1868. The wonders of nature and art combine to make it the goal of many thousands of pilgrims annually, and of all foreign tourists who have time to spare. As a holy place, it began to win reputation even in the 8th c., but the present magnificent shrines, masterpieces of Japanese art, date from 1617. Hachi-ishi is the village of hotels at the mountain foot. Nantaizan is the loftiest peak of the range. The lake Chiuzenji and the lofty water-fall of Kiri-furi (tumbling mist) are striking features famous in literature and art. The chief priest of the shrines was always a prince of the imperial blood, and an annual envoy was sent by the mikado to pay honor to the memory or Iyeyasu. Works of art in wood-carving, bronze, granite, and other stone, and gifts from daimios and pilgrims, from Holland, Loo Choo, Corea, etc., make this one of the historic spots for travelers of every nation.

NIKOLAÏEF, a t. of s. Russia, in the government of. Kherson, 40 m. n.n.w. of the town of that name, stands 20 m. above the mouth of the Bug, and at the confluence of that river with the Ingul. It was founded in 1790, and its situation was found so convenient for ship-building purposes that it soon became the center of naval administration of the Black sea. It has broad, straight streets, containing several barracks, a cathedral, schools for pilots, hospitals, an observatory, and an arsenal. In the first half of the present century about 10,000 men were employed at Nikolaief in ship-building and other naval operations. Since the opening of the railway system, by which it has connection with Moscow, etc., the population and trade have greatly increased. Pop. '67, 67,972.

NIKOLAEVSK, chief t. of the Amoor territory, in e. Siberia, situated on a well-wooded plateau on the left bank of the Amoor, and 25 m. from its mouth, 6,750 m. e. of St. Petersburg. The approaches to the town are defended by four batteries. The Amoor is here a mile and a quarter broad, but the landing place is available only for small craft, all large vessels being compelled to lie in mid-stream. Pop. '67, 5,314.

NI'KOLSBURG, or MI'KULOV, a t. of Austria, in the s. of Moravia, 27 m. s. of Brunn, lies at the foot of the Pollaver hills, famous for their rich red wines. The town belongs to the princely family of Dietrichstein. It has several steam-mills, and cotton and silk factories. In the middle of the town, upon a rock, stands the castle of the Dietrichsteins, with a library of 20,000 volumes, and a vat in the cellars capable of containing 2,000 eimers (more than 30,000 gallons). Pop. '69, 7,173, of whom more than half are Jews.

NIKON, Patriarch of the Russian church, 1605–81; b. near Nijni-Novgorod, Russia, of humble parentage; received his education from a monk in the monastery of St. Macarius. He afterward became a priest, but was so much attached to the monastic life that he entered the hermitage of Anserche, on the island of Solowetz, in the White sea. He separated from his wife, with whom he had lived ten years, and persuaded her to enter the convent of St. Alexis at Moscow. His fellow-monks desiring to exchange their wooden church for one of stone, Nikon and Elizar (the founder and head of the hermitage), were sent to Moscow to procure contributions for the purpose. Elizar appropriated the money obtained to his own use. Nikon remonstrated; his associate became his enemy. Nikon, unable to endure his persecution, left the island in a small boat, and after exposure to great peril he reached the island of Kj, at the mouth of the Onega. Here he erected a wooden cross, and vowed to build a monastery on the spot, which vow he fulfilled. In 1666, having occasion to go to Moscow on business for the monastery of which he was abbot, the czar Alexis Micailovid appointed him archimandrite of the Novaspasky convent at Moscow. He used his influence with the czar in behalf of poor widows, orphans, the persecuted, and oppressed. In 1648 he was made metropolitan of Novgorod, and became much endeared to the people. In 1650 he quelled a violent popular insurrection at the peril of his own life, and then obtained permission to go to the prisons and release those who had been unjustly incarcerated, as well as real criminals who were sincere penitents. He showed great kindness to the poor. He preached to crowds, revised the liturgy of the Russian church, and caused the clergy to perform divine service with more devotion. On the death of the patriarch Joseph, Nikon in 1652 was appointed patriarch. In 1654–55 he called a council of the church to take measures for making the church books conform to the Greek originals. The council compared with the Septuagint the Slavonic versions, some of which were five centuries old, and found them correct, and that the errors in the books in common use were owing to the carelessness of transcribers. A new edition, made at Moscow and set forth by Nikon, created a division in the church. Nikon endeavored to root out all abuses of the hierarchy, to promote temperance, setting the people an example of abstemious habits. Sacred pictures to which he believed the people paid idolatrous veneration he removed. The baptisms of the western church, then and now considered by the Greek church invalid, he sanctioned. Education, begun by Ivan the terrible but interrupted by war, he encouraged. The printing press was again set up. Greek and Latin were now for the first time taught in the schools. He made also many useful changes in the church service. The greatest reform was the revival of preaching. From Nikon was first heard, after many centuries, a living, practical sermon. These changes greatly agitated the church, but the czar's favor did not fail, until in 1658 his enemies succeeded in alienating the czar from him, and Nikon retired to the monastery of the Resurrection of Christ that he had himself built. The misunderstanding between him and the czar increasing, and Nikon refusing to return to Moscow, a council was called in 1667 to consider his case, under the presidency of the eastern patriarch; and on Dec. 12 of that year he was deposed, and banished as a common monk to the Bielvozersky Therapontic monastery. The czar Feodor Alexievich allowed him to remove to the monastery of the Resurrection of Christ, but on the journey thither he died. He was buried in that monastery in the presence of the czar; his absolution was obtained from the eastern patriarch and he was again enrolled in the list of Russian patriarchs. "Nikon," says Stanley, "rests all but canonized in spite of his many faults, and in spite of his solemn condemnation and degradation by the nearest approach to a general council which the eastern church has witnessed since the second council of Nicæa. He rests far enough removed from the ideal of a saintly character, but yet having left behind him to his own church the example of a resolute, active, onward leader; to the world at large, the example, never without a touching lesson, of a sincere reformer recognized and honored when honor and recognition are too late." Many historians think that with more prudence he might have saved the Russian church from a schism which still exists, and that he lacked the wisdom and policy which are essential to men in high places of trust. In 1664 Nikon sent to the east and purchased 500 MSS. of Greek books dating from the 11th to the 17th century. He also made a collection of the Russian chronicles, the Stufen books, and the Greek chronologists, which reaches to the year 1630, and is known by the name of the *Chronicle of Nikon*. The academy of sciences of St. Petersburg published a fine edition of this in 8 vols. in 1767–92. He wrote also several theological treatises, of which the following are the most important: *A Table of Dogmatic Studies; Sermons; The Intellectual Paradise*, containing a description of the monasteries of mount Athos and of Valdaï; *A Canon*, or book of prayers. Stanley in his *History of the Eastern Church*, Palmer in the *Patriarch and the Tsar*, Eckardt in *Modern Russia*, and the *London Review*, have given a particular account of the patriarch Nikon.

NIKO'POL, a thriving t. of s. Russia, in the government of Ekaterinoslav, on the right bank of the Dnieper, about 200 m. from its mouth, in lat. 47° 33' north. Nikopol is the center of an extensive agricultural district, the produce of which is here shipped to Odessa. Between Nikopol and the port of Odessa there is regular communication by steamboat. The natural advantages of Nikopol promise to make it one of the principal commercial centers on the Dnieper. Pop. '67, 8,758.

NILE (*Nilus*), called by the Egyptians *Hapi Mu* (the genius of the waters), and by the Hebrews *Sihor* (the black), the river of n.e. Africa formed by the union of the Bahr-el-Abiad (the White or true Nile) and the Bahr-el-Azrek (Blue Nile). Capts. Speke and Grant discovered that the first of these, the true Nile, flowed out of the lake Victoria Nyanza, which extends from about lat. 0° 20' n., to 2° 40' s., and from long. 31° 40' to 35° e., and is 3,800 ft. above the level of the sea; and the river Shimiyu, the largest tributary of this lake, flowing into its southern extremity, must now be regarded as the most southerly source of the Nile. The second, the Blue Nile, has its source in Abyssinia, in lat. 10° 59' n., and long. 36° 55' east.

The White Nile, from its outfall from the Victoria Nyanza at the "Ripon falls," lat. 0° 20' n., long. 33° 30' e., flows n.w. and w. for about 230 m., till it enters the lake Albert Nyanza, within 30 m. of its northern extremity, where the river again emerges. On issuing from the Victoria Nyanza the Nile rushes down due n. like a mountain-torrent, running off at last into long flats, and expanding so as to form what is called Ibrahim Pasha lake. In this part of its course the river is navigable, and continues to be so until it reaches the Karuma falls. From these falls to the Murchison falls (120 ft. in height), near the Albert Nyanza, the river forms a series of rapids. Between the two Nyanzas the Nile is known as the Victoria Nile, or Somerset river

After leaving the Albert Nyanza, the Nile begins its northward course to the Mediterranean, and has no further lake expansion. Between the Albert Nyanza and Gondokoro (Ismailia), in 4° 55' n. lat., and 31° 51' e. long., 1500 ft. above the sea, the Nile river descends several hundred feet in a series of rapids and cataracts. For about 500 m. after Gondokoro the Nile flows very tortuously, first in a north-westerly and then in a north-easterly direction, and is joined, in about lat. 9° 15' n., long. 30° e., by its first great affluent, the Bahr-el-Gazal, which joins the Nile from the w. with hardly any perceptible current. The second tributary is the Giraffe river, about one-third the volume of the Nile at its point of junction, long. 31° east. From the Bahr-el-Gazal the Nile flows in a due easterly direction for about 80 m., then s. for 30 m., when it is joined by its third tributary, the Sobat river, from the east. The Sobat is full and navigable. Between this and the town of Khartoum, a distance of about 460 m., the Nile runs in a northerly direction, with a width of from one to two m., and is joined by several streams from the e. side.

Khartoum, the capital of Nubia, is situated at the confluence of the Bahr-el-Azrek (Blue Nile) and the Bahr-el-Abiad (White Nile), 1188 ft. above the sea level, in lat. 15° 35′ n. long., 32° 30′ east. The Bahr-el-Azrek, long supposed to be the main branch of the true Nile, is formed by the junction of the Abai and the Blue river. The Abai has its source in Abyssinia, 50 m. from lake Dembea, which it enters from the s.w.; emerging on the s.e. of the lake, it flows for about 90 m. in that direction, when it describes a semicircle round the peninsula of Godjam, and continues north-westerly for about 150 miles. It is here joined by the Blue river from the s., and from this point the Blue Nile flows n.w. to Khartoum, receiving from the e. two large rivers running nearly parallel to each other, the Dender and the Rahad or Shimfa. From Khartoum, the united stream flows n. for about 60 m., passing the town of Halfaia and the ruins of Meroë to the first cataract, and thence n.e. past Shendy (q.v.) to its junction with the Atbara, which enters the Nile at El Damer, lat. 17° 45′ n., long. 34° east.

The Atbara, also called Bahr-el-Aswad, or Black river, because it carries down with it the greatest amount of the black mud and slime that manures and fertilizes Egypt, is the last tributary received by the Nile. The Goang seems to be the direct source of the Atbara. It rises in the heights to the n. of lake Dembea. About 150 m. from its source it receives the Basalam river, and about 30 m. further on, the Takazze or Setit river, both from the east. The Takazze has a far greater volume of water than either of the preceding rivers. It rises in the Samen mountains, round which it flows first easterly, then n., till in about lat. 13° 30′ n., long. 38° 50′ e. it turns n.w., and then almost due w., joining the Atbara at right angles. It has many tributaries.

From its junction with the Atbara the Nile continues to flow northerly through the populous and fertile district of Berber, full of villages, and then enters the desert. Turning westwards in lat. 19° n., it forms the large island of Mograt, and makes a curve to the south-westward, known as the "great bend," in which there are two cataracts. Entering Nubia, the Nile resumes its northwesterly course, with narrow strips of cultivated land on each bank. Here it forms another cataract, and bends round to the n.e. with a fifth cataract, in lat. 21° 40′ north. After this the valley of the Nile narrows, and at Assouan, in lat. 24° 10′ n., it forms the last cataract in descending.

From Assouan to the sea the average fall of the Nile is two inches to a m., and its mean velocity about three m. an hour. It waters and fertilizes the whole length of the land of Egypt. The delta of the Nile extends from lat. 30° 10′ n. to 31° 30′ n., and has a base on the Mediterranean of about 150 miles. In it the Nile spreads out into numerous streams, the two principal being those of Rosetta and Damietta. The total length of the Nite, from its exit from the lake to the sea, is about 3,300 m., measured along its course, or about 2,200 m. direct distance.

A feature peculiar to the river of Egypt is that from its junction with the Atbara, to its mouth, a distance of upwards of 1500 m., it receives no affluent whatever, and yet it is able to contend with the burning sun, and scarcely less burning sands of Nubia. With the ancient Egyptians the river was held sacred: the god Nilus was one of the lesser divinities. Its annual overflow is one of the greatest marvels in the physical geography of the globe for it has risen to within a few hours of the same time, and to within a few inches of the same height, year after year for unknown ages. At Khartoum it begins to increase early in April, but in lower Egypt the inundation usually begins about the 25th of June, and attains its height in about three months. It remains stationary about twelve days, and then subsides. The cultivable soil of Egypt is wholly dependent on the rise of the Nile, and its failure causes a dearth; for, virtually, the country has no rain. Continuous south wind brings a good, and north wind a bad year. During a good inundation the rise is about 40 ft. on the tropic of Capricorn, 36 ft. at Thebes, and 4 ft. at the Damietta and Rosetta mouths in the Delta. If at Cairo the rise is only 18 or 20 ft. there is a scarcity; up to 24 ft., a deficiency; 25 to 27 ft. is good: more than that causes a flood, and fosters plague and murrain. During the inundation the whole valley is covered with water, from which the villages rise like islands, protected by dikes. Of late years the overflow has been greater than the average of many centuries. The rise and fall of the trunk stream of the lower Nile is owing to the periodicity of the rains on the mountains of Abyssinia and in the basin of lake Nyanza, where, on the equator, it rains, more or less, all the year round, most copiously during the equinoxes. The banks of the Nile swarm with birds, among which are vultures, cormorants, geese, pelicans, quails, and the white ibis; and its sweet, soft waters teem with fish. The average amount of alluvium brought down by the river is estimated at a deposit of 4¼ inches in a century—by some it is made as high as 6 inches; the greater part of it is brought down by the Atbara

The question of the source of the Nile is at once the oldest and the most recent of geography. That the sources of a river, at whose mouth one of the earliest and most civilized peoples was established, should have been so long veiled in obscurity is unparalleled in geographical research. The want of success in exploring the upper basin of the Nile may be attributed to the great length of the river, to the difficulties which beset the traveler in the physical nature of the countries he must pass through, the climate, and the jealousy, ignorance, and barbarism of the native tribes. This problem of centuries may now be regarded as satisfactorily solved; for the question whether there may not yet be found important feeders of the White Nile carrying back its source to a still greater distance in the interior is practically excluded by Stanley's exploration of the Lualaba or Congo basin. The journeys of Krapf and Rebmann to the foot of Kilimandjaro and the other snowy mountains in the e. of Africa, believed by them to be the ancient "mountains of the moon," and the explorations of the White Nile, pointed to the conclusion that it was among these mountains that the sources of the great river would ultimately be discovered.

There was, however, another theory. Rumors gathered from the natives pointed to lakes in the regions s. of the equator as the true sources of the Nile. To explore this country the distinguished traveler, capt. Richard Burton, accompanied by capt. Speke, started from the Zanzibar coast in 1857. Their enterprise was so far successful that they discovered lake Tanganyika, in lat. 5° s., long. 36° e., and a large crescent-shaped mass of mountains overhanging the northern half of the lake, and 10,000 ft. high, considered by capt. Speke to be the true Mountains of the Moon. On the shores of lake Tanganyika Burton was laid up by illness, and his companion, after surveying the northern portion of the lake, left him there to recruit his health, while he (Speke) proceeded northwards to discover another huge "nyanza" or lake, of the existence of which he was informed by the natives. This he accomplished on Aug. 3, 1858, when he discovered the southern end of the Victoria Nyanza (q.v.). In his journal he says of this immense sheet of water: "I no longer felt any doubt that the lake at my feet gave birth to that interesting river, the source of which has been the subject of so much speculation and the object of so many explorers."

In 1861 capt. Speke, taking with him capt. Grant, returned to the lake region. The expedition approached the Victoria Nyanza again from the coast of Zanzibar; and the first place from which they obtained a view of it, during the second expedition, was the town of Mashonde on its western side. Thence they pursued their way along the shore northwards. Crossing the equator, they reached streams which are said to flow out of the lake, and further on, in the center of its northern coast, what they considered to be the parent stream of the Nile, 150 yards in breadth, flowing over rocks of an igneous character, and forming falls 12 ft. high, which capt. Speke christened the "Ripon falls," in honor of the president of the royal geographical society at the time of his starting on the expedition.

In the kingdom of Karagwé capt. Speke found a very superior negro race, much better disposed to strangers than any of the tribes he had formerly passed through. The country occupied by this race, and that of Uganda, stretches along the Nyanza, and covers half of its western and northern shores, the Uganda being bounded on the e. by the main stream of the Nile. North of it lies the kingdom of Unyoro, where the dialects belonging to the language of s. Africa, and which up to this point are used by the various tribes, suddenly cease, and give place to those of the language of n. Africa.

At Gondokoro Speke and Grant were met by Mr. (now sir Samuel) Baker, who had come from Cairo to their relief. Baker, accompanied by his heroic wife, pushed still southwards, and had the happiness of discovering, in 1864, another great lake, which he called the Albert Nyanza. In 1869 he undertook a second great expedition, of a military character, at the expense of the pasha of Egypt, to suppress slavery in the upper regions of the Nile; and has reduced under the sway of that ruler the whole valley of the river as far as the Victoria Nyanza. Sir Samuel returned in Sept., 1873.

Meanwhile Dr. Livingstone had been working for many years, from another quarter, at the solution of the great African problem—the true source of the Nile. In 1866 he began the great journey from which he was destined never to return. Starting from the Rovuma river, in the far s., he passed round the s. end of lake Nyassa, proceeded northward, exploring the lakes Bangweolo and Moero; and in 1869 reached lake Tanganyika, now known to send its outflow towards the Congo, but which he sought in vain to connect with the Victoria Nyanza. In 1871 he was found by Mr. Stanley at Ujiji, on lake Tanganyika, and it was then his opinion that neither Tanganyika, nor the Albert Nyanza, nor the Victoria Nyanza was the true source of the Nile, nor any of the feeders of these lakes; but that it was to be sought in a basin lying westward of them, through which flow three large rivers, all called Lualaba, and which unite to form another great lake, which he called Lincoln. Out of this a river runs northward, which he conceived to be the main branch of the Nile. Geographers at home generally believed that Livingstone was mistaken, and had struck instead upon the source of the Congo; but the death of the great traveler before the completion of his explorations left the problem unsolved. It was not until Mr. Stanley in 1876–77 followed the course of the Lualaba to its mouth that this stream was definitely proved to be identical with the Congo. Mr. Stanley's explorations in 1875, ere he struck the Lualaba, have given us more accurate information as to the size and shape of the Victoria Nyanza (see NYANZA), and as to its affluent, the Shimiyu.

NILES, a city in Berrien co., Mich., on the St. Joseph river, at the head of navigation; on the Michigan Central railroad, 93 m. e. of Chicago; pop. of city, '74, 4,592.

Niles was settled in 1828; it is furnished with water-power by a dam built across the river. There are numerous mills of various kinds, foundries, and machine-shops, a national bank, public schools, weekly newspapers, and 8 churches. The outlying districts produce large quantities of lumber, grain, and fruit, which are brought here for shipment.

NILES, Hezekiah, 1777–1839; b. Penn.; received an ordinary education and learned the printer's trade. In 1800 he became a member of the firm of Bonsall & Niles, printers and publishers, in Wilmington, Del. The business was not successful, and Niles for several years was a newspaper contributor and editor, being for six years the managing editor of a Baltimore daily. In 1811 he began the publication of *Niles's Register*, and continued it for 25 years. This weekly paper contained very valuable articles on political and financial subjects, and historical papers of great importance. Niles republished the work in book form (32 vols.) in 1828, and it was continued after his death by W. O. Niles, Jeremiah Hough, and George Beattie until 1849. Niles also published *Principles and Acts of the Revolution*, 1822. He was a strenuous advocate of a protective tariff.

NILES, John Milton, 1787–1856; b. Hartford, Conn., and was in early life a farmer. His education was mostly self-acquired, and before he was of age he began the study of law. After his admission to the bar he spent two years in Vermont, New York, and Pennsylvania, but in 1817 returned to Hartford and there founded the *Times*, a democratic newspaper, with which he was connected as editor and contributor for 30 years. He was for some years a county judge, was a member of the general assembly, and in 1829 was made city postmaster by president Jackson, resigning the position on his appointment to fill a vacancy as U. S. senator, 1835–39. He was made postmaster-general in 1840, and in 1843 was elected U. S. senator for a full term. He published, besides many addresses, orations, and speeches: *History of South America and Mexico, and a View of Texas* (1839); *Life of Commodore Oliver H. Perry* (1820); and other books.

NILES, Nathaniel, 1741–1828; b. R. I.; after graduating at the college of New Jersey in 1766, studied medicine and law, and afterwards theology with Dr. Bellamy, and taught school in New York city. He obtained a license to preach in Congregational churches, and settled in Norwich, Conn. He was confined to no pastorate, but preached as occasion offered, and was accounted earnest and zealous. He was versed in mechanics, and invented a process by which bar-iron could be made into wire by the use of water-power; first employed in a wool-carding factory. He was speaker of the house of representatives of the legislature of Vermont in 1784, having removed to West Fairlee, Orange co., in that state, and was prominent in the politics of his time. At the close of the revolutionary war he was a candidate for national honors, and was member of congress, 1791–97, and a judge of the supreme court. He was chosen presidential elector for six successive administrations, and was appointed one of the censors on the revision of the state constitution. During the revolutionary war he composed a war-song, *The American Hero*, which became very popular. He contributed a number of valuable essays to the *Theological Magazine*, and published several sermons, lectures, and essays In 1773 he published *Two Discourses on Confession of Sin and Forgiveness*, and *Four Discourses on Secret Prayer*. In 1777 there appeared two sermons entitled *The Perfection of God the Fountain of Good.* In 1809, a *Letter to a Friend.* He wrote a *History of the Indian Wars.*

NILES, Samuel, 1674–1762; b. on Block Island, R. I.; graduated at Harvard university, 1699; became a Congregational minister; preached in Kingston, R. I., from 1702 till 1710; was installed in May, 1711, as pastor of Second church, Braintree, Mass., where he remained till his death. He published *A Brief and Sorrowful Account of the Present Churches in New England*, 1745; *God's Wonder-working Providence for New England in the Reduction of Louisburg*, a poem, 1747; *Vindication of Divers Important Doctrines*, 1752; *Scripture Doctrine of Original Sin*, 1757; and was the author of an unfinished *History of the French and Indian Wars*, published in Massachusetts historical collection, 3d series, vol. vi.

NIL-GHAU. See Nyl-Ghau, *ante*.

NILOM'ETER (the measurer of the Nile), the name of two buildings existing in Egypt, one in the island of Rhoda, opposite to Cairo, the other at Elephantine, close to Assouan, in 24° 5′ 23″ n. lat. The first consists of a square well, in which is placed a graduated pillar of marble, and is called a *mekkias* or measure; the pillar contains 24 *devakhs* or cubits, each of which measures 21.386 in., or according to Greaves, 1824 ft., and contains 24 digits; but in its present state it does not appear to have been intended to mark a rise of more than 16 cubits. This pillar is exceedingly slender. The building formerly had a dome, bearing a Cufic inscription, dated 847 A.D., and is said to have been erected by the calif Mamun, or his successor, Wathek Billáh. The first-mentioned monarch is said to have erected another nilometer at the village of Banbenouda, in the Saeed, and to have repaired an old one at Ekhmin. The calif El Motawukkel built the present one. The mode of calculating the increase at the nilometer is rather complex, and to a certain extent arbitrary, political and financial reasons rendering the process a mystery even to the natives. At the present day the Nile is supposed to have risen to 18 cubits when the canals are cut; this is the height of the lowest inundation; 19 cubits are considered tolerable, 20 excellent, 21 adequate, and 22 complete; 24 are ruinous. In the time of Edrisi, however, 16 cubits were considered sufficient. The object of these nilometers was to measure the amount of taxation to be imposed on the country. The nilometer at Cairo is, however, much more recent than that existing at Elephantine, which consists of a staircase between two walls descending to the Nile. One of these walls has engraved on it a series of lines at proper intervals marking the different elevations to which the river rose under the Cæsars. The cubits here are divided into 14ths or double digits, and measure 1 foot 8.625 inches. This nilometer is described by Strabo. The probability is that many nilometers existed in the days of the Pharaohs, probably one in each city. In the days of Mœris 8 cubits were sufficient, but 15 or 16 were required in the time of Herodotus, 456 B.C., and this was the mean under the Romans. According to Pliny, if the inundation did not exceed 12 cubits it produced a famine, 13 starved the country, 14 rejoiced it, 15 was safety, and 16 delight, and this number is symbolically represented by the number of children playing round the river god on statues of the Roman period. The oldest nilometer appears to have been erected at Memphis, and it was transferred by Constantine to a church in the vicinity of the Serapeium; but Julian sent it back to this temple, where it remained till its destruction by Theodosius. At the present day the rise is watched for with anxiety, and proclaimed by four criers.—Herodotus, ii. 13; Strabo, lib. xvii.; Wilkinson, *Topogr. of Thebes*, pp. 311–17. Hekekyan Bey, *Siriadic Monuments* (Lond. 1863), p. 145.

NILS'SON (ROUZAUD), Christine, b. Sweden, 1843. At an early age showed a taste for music, and although her parents were in humble circumstances, became quite proficient on the violin, learned the flute, and attended fairs and other places of public resort, at which she sang, accompanying herself on the violin. While performing in this manner at a fair at Ljungby in 1857, her voice attracted the attention of F. G. Tornérhjèlm, a gentleman of influence, who sent her to Stockholm, where she received instruction from Franz Berwald. She made her début at Stockholm in 1860, and then went to Paris to continue her musical education, under Masset and Wartel. In 1864 she appeared at the Theâtre Lyrique of Paris, as Violetta in *Traviata*, with such success that she was engaged to sing for three years. She made her first appearance in London in 1867, where she immediately became a favorite. In 1868 she sang the part of Ophelia in the opera of *Hamlet*, by Ambroise Thomas, at the Grand Opera in Paris. During the same year she sang in England at the Handel festival at the Crystal palace. In 1870 she came to America, appearing in concerts and operas, and achieved popularity wherever she was heard. She was married at Westminster abbey, in 1872, to Auguste Rouzaud, a merchant of Paris. After creating great enthusiasm at St. Petersburg, she returned to America with the Strakosch Italian opera troupe, containing such artists as Campanini-Maurel, Capoul, Del Puente, and Annie Louise Cary. She appeared as Elsa in Wagner's *Lohengrin*, and sang during the same season in opera with Pauline Lucca. Her remarkable voice and unusual dramatic gifts have combined to make her one of the foremost singers of the time.

NIMBUS, in art, especially in sacred art, is the name given to the disc or halo which encircles the head of the sacred personage who is represented. Its use is almost universal in those religions of which we possess any artistic remains—the Indian, the Egyptian, the Etruscan, the Greek, and the Roman. In the Hebrew scriptures we trace, in the absence of representations, the same symbolized idea in the light which shone upon the face of Moses at his return from Sinai (Exod. xxxiv. 29–35), and in the light with which the Lord is clothed as with a garment, Ps. ciii. 1, Vulg. (civ. 1, auth. vers.); and in the New Testament in the transfiguration of our Lord (Luke ix. 31), and in the "crowns" of the just, to which allusion is so often made (2 Tim. iv. 8; 1 Peter v. 4; Apoc. iv. 4). Nevertheless, the nimbus, strictly so called, is comparatively recent in Christian art, appearing first toward the end of the 5th century. Later, in Christian art, it became almost a necessary appendage of all representations of God or of the saints. Its ordinary form is the circular or semicircular; a form, indeed, in which later symbolists discover an emblem of perfection and of eternity; but the nimbus of the Eternal Father is often in the form of a triangle, and that of the Trinity an emanation of light, the rays of which form the three arms of a cross. The nimbus of the Virgin is sometimes a simple ring, and sometimes a crown or diadems; occasionally it is encircled by an ornamental border, on which twelve stars are sometimes represented. Her nimbus, as well as that of the divine persons, is commonly of gold; but that of the Virgin Mary is occasionally in colors, as blue, red, purple, or white. The nimbus of the saints is ordinarily the semicircle or lunula. Dedron mentions the curious instance of a picture of the traitor Judas *with a black nimbus!* In later art the nimbus became lighter and more aërial, melting, as it were, into the picture; and in Raphael's saints it occasionally fades into the very faintest indication of a golden tinge around the head. In connection with the nimbus may also be mentioned two analogous forms—the *aureole* and the *glory*. The former is an illumination surrounding, not the head only, but the entire figure. If the figure be upright, the aureole is commonly oval, when it is called the *vesica piscis*, and is supposed to contain an allusion to the *icthys*. With a seated figure it becomes circular, and is occasionally divided by radiating bands, in the form of a wheel; sometimes it taks a quatrefoil form. It is commonly of gold, but occasionally also is in colors. The glory is a combination of the nimbus and the aureole, and is chiefly seen in Byzantine pictures, and those of the early South German school.

NIMEGUEN. See NIJMEGEN.

NÎMES (anc. *Nemausus*), a t. of France, capital of the department of Gard, stands in a fertile plain surrounded by vine-clad hills, 30 m. n.e. of Montpellier, with which it is connected by railway. It consists of the town proper (ill built and dirty), and of three handsome suburbs. In the vicinity are the beautiful remains of the Roman aqueduct called the *Pont du Gard.* The chief of the modern edifices are the *Palais-de-Justice*, the theater, and the hospitals.* The *Grande Place* is embellished with one of the most magnificent fountains in France. Nîmes contains numerous and variously-constituted educational institutions, an important public library, Maria Theresa's museum (in the *Maison Carrée*), a museum of natural history, etc. It is the general entrepôt for the silks produced in the south of France, and its manufactures are principally silk and cotton fabrics. More than 10,000 looms are constantly in operation in the city, and about 6,000 in the immediate vicinity. Shawls, handkerchiefs, lace, brandy, wines, etc., are made. Within the town are numerous and beautiful Roman remains, the chief of which are the amphitheater; the *Maison Carrée* (square house), a fine specimen of Corinthian architecture; a temple and fountain consecrated to Diana; *La Tour Magne* (great tower); the baths, and two Roman gates. See Menard's *Antiquités de Nîmes* (1833), and his *Histoire de Nîmes* (7 vols. 1875). Pop. '76, 60,804.

Previously to the Roman invasion, Nîmes—which is supposed to have been founded by a colony from Massilia (Marseille)—was the chief city of the Volcæ Arecomici. It flourished under the Romans, and was one of the great cities of Gaul. It surrendered to the rule of the Visigoths between 465 and 585, and afterwards to that of the Franks. Subsequently it became a possession of Aragon, but was finally restored to France in 1259 by the treaty of Corbeil. The inhabitants adopted Calvinism in the 16th c., and on many occasions suffered severely for their religious principles. In 1791 and and 1815, bloody religious and political reactions took place here.

NIMROD. See BABYLON.

NIMRUD is the present Arabic name for the site of an ancient Assyrian city on the e. bank of the Tigris, about 20 m. below Mosul, thought by many to be Calah spoken of in Gen. x. It is one of a group of cities which anciently were known as Nineveh, or which clustered around the metropolis of that name. The ruins are in the fork formed at the junction of the Tigris and the Zab, are about 5 m. in circumference, and were inclosed by a wall, having towers and gates, the remains of which extend around nearly the whole distance. Excavations made by Layard, Rassam, Loftus, and George Smith, laid open the following buildings: 1. A tower on the n.w. corner of the mound, extending more than 160 ft. and faced with stone to the height of 20 ft.; 2. Temples around the tower; 3. The n.w. palace, 350 ft. square; 4. The center palace, s. of the former; 5. The s.w. palace, built with materials from the n.w. and center; 6. The s.e. palace; 7. The temple of Nebo. According to the inscriptions the city was built B.C. 1320, and having been destroyed in troublous times, was afterwards rebuilt, and continued a royal residence about 170 years. Shalmaneser II., who became king, B.C. 860, conquered the country of the Euphrates, and advancing into Syria met and defeated a confederacy of kings among whom were Benhadad of Damascus, Ahab of Israel, and Baasha the Ammonite. About 720 B.C. Calah ceased to be a capital of the empire, and was finally destroyed by the Medes and Babylonians when they conquered Assyria.

NIMRUD, BIRS. See BABEL, TOWER OF, *ante.*

NINEVEH, or NI'NUS, a very ancient and famous city, the capital of the great Assyrian empire, said in scripture (Gen. x. 11) to have been founded by Ninus or Nimrod. It was situated on the e. bank of the Tigris, opposite to the present Mosul. According to the accounts of the classic writers, the city was of vast extent, 480 stadia, or more than 60 m. in circumference. Its walls were 100 ft. high, broad enough for three chariots, and furnished with 1500 towers, each 200 ft. in height. In the *Book of Jonah* it is described as an "exceeding great city of three days' journey," and one "wherein are more than six-score thousand persons that cannot discern between their right hand and their left hand" (children or infants are probably meant). After having been for many centuries the seat of empire, it was taken after a siege of several years and destroyed by the united armies of the Medes under Cyaxares, and the Babylonians under Nabopolassar, about 625 B.C. When Herodotus, not quite 200 years afterwards, and Xenophon visited the spot, there remained only ruins. Tradition continued to point pretty accurately to the site of Nineveh; but it is only of late years that actual explorations have been made. For an account of these see ASSYRIA.

NINGPO, a department in the province of Chekiang, China, comprising the city of that name, the Chusan group of islands, and the cities of Tsjke, Funghwa, Chinhai, and Tsiangshan. The port of Ningpo is situated at the confluence of two small streams, in lat. 29° 55′ n., long. 121° 22′ e., 12 m. from the sea, on an alluvial flat of extreme fertility, intersected by a net-work of rivulets and canals. Its walls are 5 m. in circumference, about 25 ft. high, 22 ft. wide at the base, and 15 at the top, with six double gates.

As is the case with all the cities in this part of China, Ningpo is permeated by canals communicating with a moat nearly surrounding the walls, and with the adjacent country, In one part of the city they expand into basins, and receive the name of lakes—the Sun lake and Moon lake. In the former is an island devoted to temples, and accessible by bridges. These bridges—good specimens of those aerial stone edifices which adorn this part of China—are required to sustain little more than their own weight, as the roads here are all mere footpaths, and no wheeled vehicles are found. One of the rivers is crossed by a bridge of boats 200 yds. long. The entire city is well paved; the streets are wider than those of most Chinese cities, and the display of shops is indicative of wealth and luxury. Nowhere, save at Hanchau, are such extensive and beautiful temples to be found. The most elegant and costly of these is dedicated to the queen of heaven; the goddess being the daughter of a Fuhkien fisherman, the people of that maritime province are her more special votaries. Elaborate stone sculpture, exquisitely fine wood carving, and a profusion of gilt and tinsel show that no expense has been spared to honor the popular goddess.

The center of the city is ornamented with an elegant seven-storied hexagonal tower—the heaven-bestowed pagoda, 160 ft. in height. A spiral flight of steps within the walls of the tower lead to the summit, from which the gazer beholds a splendid scene; innumerable villages dot the plain, which is reticulated by silvery water-courses, replete with evidence of successful commerce and agriculture. The population of the city is about 300,000; that of the plain, about 2,000,000. On many of the hills which environ these cities, green tea is successfully cultivated; while the mulberry, the tallow-tree, and numerous other stimulants of industry abound. Two crops of rice are procured annually from the fields; while the fisheries of the rivers and adjacent coast give employment to a numerous class of the population. Ice-houses close to the river give the banks a picturesque appearance; the ice is used for curing fish. Ningpo has an extensive coasting trade; but no considerable foreign trade has been developed, owing mainly to porterages on the inland water-communications, and to the proximity of Shanghai, where no such obstructions exist. The district city of Chinhai, at the mouth of the Ningpo river, is also a port. A walled town, containing about 30,000 inhabitants, 10 m. to the e. of Chinhai, is Kingtang, the nearest of the Chusan archipelago. Tinghai is the district city of the island of Chusan, which is 20 m. long, from 6 to 10 wide, and 51 in circumference. It is mountainous, with fertile valleys in a high state of cultivation. It has an excellent harbor. Tinghai was garrisoned several years by her majesty's forces from 1841, and was again temporarily occupied by the allied forces in 1860.—Dr. Macgowan's *Lectures.*

NINIAN, Saint, the apostle of the Picts, lived in the latter half of the 4th and the beginning of the 5th century. Whether Christianity had been introduced among the Picts before the time of Ninian has been a subject of controversy; but although the details of the legendary account are uncertain, it seems, beyond all question, that some Christians were to be found, at least among the southern Picts, in what is now known as the lowlands of Scotland, from the end of the 2d century. Nevertheless, either their number was originally very small, or the rising church had fallen away under adverse circumstances; and it is certain that when Ninian appeared among them, the Picts were in the main a pagan people. He was a Briton, and of noble birth; but had been educated at Rome, and there ordained a bishop. The exact time of his preaching in Scotland is unknown. His labors appear to have commenced in Cumbria, and to have extended over the greater part of the district as far n. as the Grampian hills, his see being fixed at Candida Casa, or Whithorn, in the modern Wigtonshire. His death is placed by the Bollandists in 432; his festival is Sept. 16.

NINIGRET, about 1610–77; a Narragansett chief who figured in the Pequot war of 1632, and as an ally of the colonists in 1637. A visit to the Dutch on the island of Manhattan caused him to be suspected by the Connecticut colony of plotting against the English colonists. The commissioners of the united colonies in 1653 declared war against him while he was making war on the Indians of Long Island. A summons was sent him from Hartford to appear there, which he failed to comply with; whereupon maj. Simon Willard was sent against him, and forced him to leave the country. In 1660–62 the colonists bought his lands,

NINON DE LENCLOS, a celebrated French woman, one of those characters that could have appeared only in the French society of the 17th c., was born of good family at Paris in 1615. Her mother tried to imbue her mind with a love of the principles of religion and morality, but her father, more successfully, with a taste for pleasure. Even as a child she was remarkable for her beauty and the exquisite grace of her person. She was carefully educated, spoke several foreign languages, excelled in music and dancing. and had a great fund of sharp and lively wit. At the age of ten she read Montaigne's *Essays.* Six years later, she commenced her long career of licentious gallantry by an amour with Gaspard de Coligny, then comte de Chatillon. To Coligny succeeded innumerable favorites, but never more than one at a time. Among Ninon de Lenclos's lovers we may mention the marquis de Villarceaux, the marquis de Sevigné, the marquis de Gersay, the great Condé, the duc de Larochefoucauld, marshal d'Albret, marshal d'Estrées, the abbe d'Effiat, Gourville, and La Châtre. She had two sons, but never showed in regard to them the slightest instinct of maternity. The fate of one was horrible. Brought up in ignorance of his mother, he followed the rest of the world, and conceived a passion for her. When she informed him of the relation that subsisted between them, the unhappy youth was seized with horror, and blew out his brains in a frenzy of remorse. Even this calamity did not seriously affect Ninon de Lenclos; she was too well-bred to allow it to do that. Ninon de Lenclos was nearly as celebrated for her manners as for her beauty. The most respectable and virtuous women sent their children to her house to acquire taste, style, politeness. So great was her reputation, that when queen Christina of Sweden came to Paris, she said she wished particularly to visit the French academy and Ninon de Lenclos. We may gather some idea of her wit and sense from the fact that Larochefoucauld consulted her upon his maxims, Molière upon his comedies, and Scarron upon his romances. She died Oct. 17, 1706, at the age of 90, having preserved some remains of her beauty almost to the last.—See Guyon de Sardière's *Vie de Ninon de Lenclos;* Saint-Evremond's *Œuvres;* Douxmesnil's *Mémoires pour servir à l'Histoire de Mlle. de Lenclos.*

NINTH, in music, the next interval above the octave, being the same interval which an octave lower is termed the second. See Interval.

NI'OBÉ, in Greek mythology, the daughter of Tantalus and (according to the most popular version of the story) the sister of Pelops. She was the wife of Amphion, king of Thebes, and bore him six sons and six daughters. Proud of her children, she despised Leto or Latona, who had only two children, Apollo and Diana, and prevented the people from the worship of these divinities; whereupon Latona, enraged, moved her children to destroy all the children of Niobé with their arrows. They lay nine days in their blood unburied, when Jupiter changed them into stone, and on the tenth day they were buried by the gods themselves. Niobé wandered about in distress, and at last was changed into stone on mount Sipylus, between Lydia and Phrygia, retaining, however, even as stone a sense of her woe. Such is the Homeric legend, which, however, was afterward much varied and enlarged. Niobé was a favorite subject of the ancient artists. A group representing Niobé and her children was discovered at Rome in 1583, and is now in Florence. Some of the sculptures are very beautiful. Even the ancient Romans were in doubts whether the work proceeded from Scopas or Praxiteles.

NIO'BIUM (symbol, Nb) is a rare metal discovered by H. Rose in the mineral *tantalite*. It is obtained by reducing the double fluoride of niobium and potassium with sodium; and forms a black powder insoluble in nitric acid, but readily soluble in a mixture of nitric and hydrofluoric acids. With oxygen it forms two compounds, niobous acid, NbO, and niobic acid, NbO_2; and chlorine, bromine, fluorine, and sulphur compounds corresponding to these acids have been prepared and examined. Neither the metal itself nor any of its compounds are of any practical importance.

NIOBIUM (*ante*) is now understood to be no separate metal, but the same with columbium. Pelopium, another supposed new metal, is merely the oxide of niobium or columbium.

NIOBRA'RA, a diocese of the American Protestant Episcopal church, including the greater part of Dakota, and bounded by the Missouri river, the line between Dakota and Nebraska, the 104th degree of w. long., and the 46th degree of n. lat. Yankton agency is the episcopal residence.

NIOBRA'RA RIVER, or L'Eau qui Court, rises in Laramie co., e. Wyoming territory, and flows in a generally e. course through n. Nebraska, entering the Missouri about 36 m. s.w. of Yankton, Dakota; length about 450 miles. The stream is shallow, not navigable, and very rapid in its course. In the upper part it flows through a very deep cañon, afterward passes through a sandy desert, but in the lower part winds through a fertile and well-watered region.

NIORT, a t. of France, capital of the department of Deux-Sèvres, on the Sèvre-Niortaise, is situated in an agreeable country, occupying the slope of two hills and the valley which intervenes, 110 m. n. of Bordeaux. Its principal edifices are the church of Notre-Dame, the town-hall, the theater, and the old castle. Besides these, the beautiful fountain du Vivier, the promenades, the library, and the college are worthy of notice. The dressing of chamois and the manufacture of gloves are the principal branches of industry. Dyeworks and tanneries are in operation. Pop. '76, 20,336.

Niort is an ancient town. In the 14th c. it was taken by the English, and held by them for 18 years.

NIPA, a genus of endogenous plants referred by some botanists to the order *pandanaceæ*, and by others to palms. *N. fruticans* is very common in the Eastern archipelago, and northwards as far as the Mergui river, but becomes rare further north. It flourishes with the mangrove in places inundated when the tide rises. It abounds in saccharine sap, from which a kind of *palm wine* is made, and also excellent sugar. The leaves are much employed for roofing houses, and large quantities are sent from the Tenesserim provinces northwards for this use.

NI'PADITES, a genus of fossil palm fruits found in the eocene clays of the island of Sheppey, in Kent. They are referred to *nipa* as their nearest living ally, and are considered to have resembled in habit that genus, and to have grown on the banks of an immense river which flowed from the tropical regions of a continent lying to the southward, and entered the sea at Sheppey, where it deposited the fruits and leaves borne down with the current, by the side of the starfishes and mollusca which inhabited the estuary. Some 13 different kinds have been described.

NIPIGON, or **NEPIGON**, **Lake**, 35 m. n. of the most northerly part of lake Superior, in lat. 50° n., long. 88° w., about 70 m. long from n. to s., and 40 m. from e. to west. A coast line, with bold headlands, and deep bays, gives a total length of shore of 580 miles. Its surface is 813 ft. above lake Superior. A great number of mountain streams flow into it, and its waters flow out through the Nipigon river, 40 m. in length, southward, to Nipigon bay of lake Superior. The lake is very deep, studded with islands, and well stocked with fish.

NIP'ISSING, a co. in n. Ontario, Canada, having the Ottawa river for its e. boundary; having lake Nipissing (50 m. long and 35 m. wide), containing many islands, and numerous other lakes; its streams include French and Sturgeon rivers; 3,722 sq.m.; pop. '71, 1791. Its surface is hilly, the portion s. of the lake being 1100 ft. above the level of the sea.

NIP'ISSING, or **NEPISSING**, **Lake**, in e. central Ontario, Canada, not far n. of the Ottawa river; length about 45 m.; greatest breadth, 28 miles. Its waters are mostly received from the n. by Sturgeon river, which connects it with a chain of smaller lakes. The only outlet is French river, by which the lake discharges into Georgian bay, an inlet of lake Huron. There are a number of small islands, and the vicinity is inhabited mostly by Indian tribes.

NIP'ISSINGS, an Indian tribe formerly living about the lake of the same name in the province of Ontario. They were known to Cartier and other French adventurers, and by them regarded as a peculiarly superstitious race. In the contests between the Hurons and Iroquois the latter drove the Nipissings n. and w. to the small lakes n. of lake Superior. They were accompanied by French priests who had already founded missions among them. After the conclusion of hostilities between the other tribes they returned eastward, and with other Algonquin tribes joined the Sulpician mission established near the lake of the Two Mountains. Their numbers have been greatly reduced.

NIPON', or **Niphon**, the largest by far of the group of islands forming the empire of Japan (q.v.). It is the main-land—the England and Wales—of Dăi Nipon, or Great Nipon, the Japanese name for the empire as a whole. Nipon is included between 33° 30' to 41° 30' n. lat., and 130° 50' to 142° 20' e. long. The inland sea of Suonada separates it from the islands of Kiusiu and Sikopf, and the strait of Sangar on the n.e. from the island of Yesso. On the n. it is bounded by the sea of Japan, and on the s. and e. by the Pacific ocean. The length of Nipon is 900 m., and its breadth 240; and it has an estimated area of 42,000 sq. miles. Yedo (q.v.) or To-Kei, the capital of the empire, and the present residence of the mikado; Miako (q.v.), his former residence; and Osaka (q.v.) are the largest towns. The chief treaty-ports are Hiogo—the outlet for the trade of Osaka—Yokohama (q.v.), and Kanagawa (q.v.). The ports of Yedo and Niegata, in the northern part of the island, on the sea of Japan, the official capital of the province in which it is situated, are situated near the great mineral region of Aidsu, but unfortunately possess a wretched harbor. Important meteorological observations, which give a good idea of the climate of the country generally, were made by Dr. Hepburn at Kanagawa, the shipping port of Yedo, in 1860. These are exhibited in a condensed form in the following table:

	Highest.	Lowest.	Rain in inches.	Snow in inches.	Number of earthquakes.
January	59° F.	18° F.			1
February	58	19	⅛	2	1
March	69	30	6½	1⅛	2
April	76	36	3¼		
May	80	44	16½		2
June	87	54	18¾		11
July	92	68	8¼		4
August	92	69	1⅒		2
September	89	62	2¼		2
October	84	50	7½		2
November	68	36	5		4
December	71	22	3⅛	1	1

Bracing sea-breezes make the heat of summer very endurable. The spring and autumn months are delightful.

NIRUKTA, or "Explanation," is the name of one of the six *Vedângas* (see Veda) which explains difficult Vedic words. That there have been several works engaged in such a task, even at a very remote period of Hindu antiquity, and that they bore the name of Nirukta, is probable, for "Nirukta authors" are quoted either generally or by name in several Sanskrit authors; but the work which is emphatically called *Nirukta*, and which, for the present, is the only surviving representative of this important Vedânga, is that of *Yâska*, who was a predecessor of Pân'ini (q.v.). His work consists of three parts—the *Naighan't'uka*, where, for the most part, synonymous words are taught; the *Naigama*, which contains words that usually occur in the Vedas only; and the *Daivata*, which contains words chiefly relating to deities and sacrificial acts. A commentary on this work has been composed by the same Yâska, and it likewise bears the name of Nirukta. In the latter, Vedic passages are quoted in illustration of the words to be explained, and the comment given by Yâska on these passages is the oldest instance, known at present to Sanskrit philology, of a Vedic gloss. Besides the great importance which Yâska's *Nirukta* thus possesses for a proper understanding of the Vedic texts, it is valuable also on account of several discussions which it raises on grammatical and other questions, and on account of the insight it affords us into the scientific and religious condition of its time.—Text and Commentary of *Yâska's Nirukta* have been edited by prof. R. Roth (Göttingen, 1852).

NIRVÂNA (from the Sanskrit *nir*, out, and *vâna*, blown; hence, literally, that which is blown out or extinguished) is, in Buddhistic doctrine, the term denoting the final deliverance of the soul from transmigration. It implies, consequently, the last aim of Buddhistic existence, since transmigration is tantamount to a relapse into the evils or miseries of *sansâra*, or the world. But as Hinduism, or the Brahmanical doctrine, professes to lead to the same end, the difference between *nirvâna* and *moksha*, *apavarga*, or the other terms of Brahmanism designating eternal bliss, and consequent liberation from metempsychosis, rests on the difference of the ideas which both doctrines connect with the condition of the soul after that liberation. *Brahman*, according to the Brahmanical doctrine, being the existing and everlasting cause of the universe, eternal happiness is, to the Brahmanical Hindu, the absorption of the human soul into that cause whence it emanated, never to depart from it again. According to this doctrine, therefore, the liberation of the human soul from transmigration is equivalent to that state of felicity which religion and philosophy attribute to *that* entity (see INDIA—*Religion*). As, however, the ultimate cause of the universe, according to Buddhism, is the void or non-entity, the deliverance from transmigration is, to the Buddhists, the return to non-entity, or the absolute extinction of the soul. However much, then, the pious phraseology of their *oldest* works may embellish the state of nirvâna, and apparently deceive the believer on its real character, it cannot alter this fundamental idea inherent in it. We are told, for instance, that nirvâna is quietude and identity, whereas sansâra is turmoil and variety; that nirvâna is freedom from all conditions of existence, whereas sansâra is birth, disease, decrepitude, and death, sin and pain, merit and demerit, virtue and vice; that nirvâna is the shore of salvation for those who are in danger of being drowned in the sea of sansâra; that it is the free port ready to receive those who have escaped the dungeon of existence, the medicine which cures all diseases, the water which quenches the thirst of all desires, etc.; but to the mind of the orthodox Buddhist, all these definitions convey but the one idea, that the blessings promised in the condition of nirvâna are tantamount to the absolute "extinction of the human soul," *after* it has obeyed, in this life, all the injunctions of Buddhism, and become convinced of all its tenets on the nature of the world and the final destination of the soul.

Although this is the orthordox view of nirvâna, according to the oldest Buddhistic doctrine, it is necessary to point out two categories of different views which have obscured the original idea of nirvâna, and even induced some modern writers to believe that the final beatitude of the oldest Buddhistic doctrine is not equivalent to the absolute annihilation of the soul.

The first category of these latter, or, as we may call them, heterodox views, is that which confounds with nirvâna the preparatory labor of the mind to arrive at that end, and therefore assumes that nirvâna is the extinction of thought, or the cessation to thought, of all difference between subject and object, virtue and vice, etc., or certain speculations on a creative cause, the conditions of the universe, and so on. All these views the Buddha himself rejects, as appears from the work *Lankâvatra* (q.v.), where relating his discourse on the real meaning of nirvâna, before the Bodhisattwa Mahâmati. The erroneousness of those views is obviously based on the fact, that the mind, even though in a state of unconsciousness, as when ceasing to think, or when speculating, is still within the pale of existence. Thus, to obviate the mistaken notion that such a state is the real nirvâna, Buddhistic works sometimes use the term *nirupadhisesha nirvâna*, or "the nirvâna *without* a remainder of substratum" (i.e., without a rest of existence), in contradistinction to the "nirvâna *with* a remainder;" meaning by the latter expression that condition of a saint which, in consequence of his bodily and mental austerities, immediately precedes his real nirvâna, but in which, nevertheless, he is still an occupant of the material world.

The second category of heterodox views on the nirvâna is that which, though acknowledging in principle the original notion of Buddhist salvation, represents, as it were, a compromise with the popular mind. It belongs to a later period of Buddhism, when this religion, in extending its conquests over Asia, had to encounter creeds which abhorred the idea of an absolute nihilism. This compromise coincides with the creation of a Buddhistic pantheon, and with the classification of Buddhist saints into three classes, each of which has its own nirvâna; that of the two lower degrees consisting of a vast number of years, at the end of which, however, these saints are born again; while the absolute nirvâna is reserved for the highest class of saints. Hence Buddhistic salvation is then spoken of, either simply as *nirvâna*, or the lowest, or as *parinirvâna*, the middle, or as *mahâparinirvâna*, or the highest extinction of the soul; and as those who have not yet attained to the highest nirvâna must live in the heavens of the two inferior classes of saints until they reappear in this world, their condition of nirvâna is assimilated to that state of more or less material happiness which is also held out to the Brahmanical Hindu before he is completely absorbed into Brahman.

When, in its last stage, Buddhism is driven to the assumption of an Adi, or primitive, Buddha, as the creator of the universe, nirvâna, then meaning the absorption into him, ceases to have any real affinity with the original Buddhistic term. See BUDDHISM and LAMAISM.

NISARD, JEAN MARIE NAPOLEON DÉSIRÉ, b. France, 1806. In 1828 he became a contributor to the *Journal des Débats*, assuming a vigorous opposition to the government of Louis XVIII. After the revolution of 1830, for a short time he gave a warm support to the Louis Philippe government, then joined the opposition, and as one of the editors of the *National* was co-laborer with Armand Carrel in the most vigorous attacks upon the sinister divergence of Louis Philippe's administration from the path marked out for it by Lafayette. But soon changing, for the remainder of his life he was a champion of the past in politics, literature, and art; and cut to the quick, in his criticisms, the works of Hugo and other poets and dramatists of his own time. His works secured attention by their profuse and graceful diction, and an agreeable expression of imagination. Guizot, prime minister of Louis Phillippe, made him supervisor of normal schools in 1835, and promoted him to higher positions each year, until he loved the government better than his former opinions, and supported Louis Philippe as warmly as he had before satirized him. He sat as deputy in the chambers, 1842–48; and in his literary work, which was continued, plainly avowed that the French spirit was in its decadence, and looked back to the age of Louis XIV. for its brightest exemplars. Left in the shade by the revolution of 1848, he recovered place and power, political and literary, under the reign of Napoleon III. As lecturer in the college of France in 1855, he made such servile use of his opinions to defend the perjuries of the emperor that the students refused to listen, and gave him a *charavari*, which resulted in the imprisonment of 15 students, and the protection of subsequent lectures by a strong police force. Napoleon rewarded Nisard by naming him commander of the legion of honor in 1856, and director of the normal school in 1857. He failed to acquire the respect of the higher order of students, and used repressive measures against the free expression of opinions in the schools and colleges of France. Among his principal works are *Histoire de la litterature Française*, *Poëtes latins de la décadence*, and an early article in the *Débats* entitled *De la litterature facile, et de la litterature difficile*.

NISBET, CHARLES, D.D., 1736–1804; b. Scotland; graduated at Edinburgh university, 1754; was for some years a prominent Presbyterian clergyman at Montrose, and by his wit and power in argument won considerable influence in the general assembly. He openly avowed his smpathy with the American colonies, and having accepted the presidency of Dickinson college, Pennsylvania, came to America in 1785, where he delivered lectures on logic, philosophy of the mind, *belles-lettres*, and systematic theology, and endeavored to bring the system of education up to his high standard. He was a great scholar, and possessed a wonderful memory. He died at Carlisle, Penn., and his posthumous works were published two years after his death; his memoirs, by Dr. Miller, in 1840.

NISCE'MI, a t. of Sicily, in the province of Caltanisetta, 10 m. n.e. from Terranova, and on the right bank of the river Terranova. In 1790 this town was visited by an earthquake, and during seven shocks, the ground gradually sank in one place to the depth of 30 feet. Fissures opened, which sent forth sulphur, petroleum, hot water, and mud. Pop. 10,750.

NISCH, or NISSA, one of the principal towns of Servia, in the district added to the principality by the Berlin congress of 1878, 122 m. s.e. from Belgrade. It stands on the river Nissawa, a branch of the Morawa. The town is ill built; but many new houses and a well supplied bazaar attest its present prosperity. Nisch has long been noted as the point of meeting of many roads, of both military and commercial importance. Its importance would be greatly increased by the proposed construction of a railway from Belgrade to Constantinople and Thessalonica. In ancient times, Nisch bore the name of *Naissos*, and was a flourishing town of upper Mœsia; in it the emperor Constantine the great was born. It was Slavonic in the 6th c., was taken by the Tartar Bulgarians in the 8th, by the Servians again in the 12th, and by the Turks in 1389. Near Nisch, in 1689, the Markgraf Louis of Baden, with 17,000 men, destroyed a Turkish army of 40,000. Pop. 13,000.

NISHAPUR', or NÜSHAPUR, a t. of Persia, province of Khorassan, 53 m. w.s.w. of Meshid, is situated in a most beautiful and fertile valley. Pop. about 8,000. It is surrounded by a rampart and trench, and has a considerable trade in *turquoises*, which are obtained from mines in its vicinity.

NISI PRIUS is the name (borrowed from the first two words of the old writ which summoned juries) usually given in England to the sitting of juries in civil cases. Thus a judge sitting at *nisi prius*, means a judge presiding at a jury trial in a civil cause, and the *nisi prius* sittings are the jury sittings.

NISI PRIUS (*ante*), originally the clause in the writ which commanded the sheriff to bring a jury to Westminster, "unless before" (*nisi prius*) a justice of assizes should come to the county where the cause of action arose. In course of time the phrase was used to designate a large class of business transacted at the assizes before superior courts, and the phrases *nisi prius* judge, *nisi prius* law, and *nisi prius* courts, came into use. At present, in England and the United States, *nisi prius* courts are those courts, or terms of courts, held for the trial of civil causes, with the presence and aid of a jury; and a *nisi prius* sitting is to be distinguished from a sitting of the court *in banco*, in full bench, for the hearing of appellate cases.

NISIBIS, the capital of ancient Mygdonia, the north-eastern part of Mesopotamia. It was situated in a fertile district, and was of importance, both as a place of strength and as an emporium of the trade between the east and west. Nisibis was a city of very great antiquity, but of its remoter history nothing is known. In the time of the Macedonio-Syrian kings it was also called *Antiochea Mygdoniæ.* It was twice taken by the Romans (under Lucullus and Trajan), and again given up by them to the Armenians; but being a third time taken by Lucius Verus, 165 A.D., it remained the chief bulwark of the Roman empire against the Persians, till it was surrendered to them by Jovian after the death of Julian in 363. The name *Nisibin* is retained by a small village in the Turkish ejalet of Diarbekr, round which are numerous remains of the ancient city.

NITER, or **SALTPETER**, as it is frequently called, is the nitrate of potash (KO,NO_5). It usually occurs in long, colorless, striated, six-sided prisms; its taste is cooling, and very saline; it is soluble in seven times its weight of water at 60°, and in less than one-third of its weight of boiling water, but is insoluble in alcohol. When heated to about 660° it fuses without decomposition into a thin liquid, which, when cast in moulds, solidifies into a white, fibrous, translucent mass, known as *sal prunelle.* At a higher temperature, part of the oxygen is evolved, and nitrate of potash is formed. Owing to the facility with which niter parts with its oxygen, it is much employed as an oxidizing agent. Mixtures of niter and carbon, or of niter and sulphur, or of niter, carbon, and sulphur, deflagrate on the application of heat with great energy; and if niter be thrown on glowing coals, it produces a brisk scintillation. *Touch-paper* is formed by dipping paper in a solution of niter and drying it.

Niter occurs as a natural product in the East Indies, Egypt, Persia, where it is found sometimes as an efflorescence upon the soil, and sometimes disseminated through its upper stratum. The crude salt is obtained by lixiviating the soil, and allowing the solution to crystallize. A large quantity of niter is artificially formed in many countries of Europe, by imitating the conditions under which it is naturally produced. The most essential of these conditions seem to be the presence of decaying organic matter whose nitrogen is oxidized by the action of the atmosphere into nitric acid, which combines with the bases (potash and lime) contained in the soil. "The method employed in the artificial production of niter consists in placing animal matters, mingled with ashes and lime rubbish, in loosely aggregated heaps, exposed to the air, but sheltered from rain. The heaps are watered from time to time with urine or stable runnings; at suitable intervals the earth is lixiviated, and the salt crystallized. Three years usually elapse before the niter bed is washed; after this interval a cubic foot of the debris should yield between 4 and 5 ounces of niter. As there is always a considerable quantity of the nitrates of lime and magnesia present, which will not crystallize, carbonate of potash, in the shape of wood-ashes, is added so long as any precipitate occurs. The nitrate of lime is decomposed, and the insolubte carbonate of lime separated:

Carbonate of Potash. Nitrate of Lime. Carbonate of Lime. Nitrate of Potash.

$$KO,CO_2 + CaO,NO_5 = CaO,CO_2 + KO,NO_5$$

The clear liquor is then evaporated and crystallized. It has been found that the earth in which niter has once been formed furnishes fresh niter more readily than on the first occasion. Care is taken that the *niter plantations*, as they are termed, shall rest upon an impervious flooring of clay, so that the liquid which drains away from them may be collected and preserved."—Miller's *Elements of Chemistry*, 2d ed. vol. ii. p. 359.

Niter does not occur in any living members of the animal kingdom, but it is found in the juices of various plants, amongst which may be named the sunflower, nettle, goose-foot, borage, tobacco, barley, etc.

All the niter used in this country comes from the East Indies. The common varieties, which have a dirty yellowish appearance, are termed *rough* or *crude saltpeter*, while the purer kinds are called *East India refined.* The purification or refining of niter is effected by dissolving it in water, boiling the solution, removing the scum, straining it while hot, and setting it aside to crystallize. The most common impurities are sulphate of potash, chlorides of sodium and potassium, and nitrate of lime. Chloride of barium will detect the first of these impurities, nitrate of silver the second, and oxalate of ammonia the third.

Niter is employed in the manufacture of sulphuric acid, in the preparation of nitric acid, as an oxidizing agent in numerous chemical processes, as an ingredient of fireworks, and especially in the manufacture of gunpowder. It is extensively used in medicine. In moderate doses (from ten grains to a scruple) it acts as a refrigerent, diuretic, and diaphoretic, and hence its use is indicated when we wish to diminish abnormal heat, and to reduce the action of the pulse, as in febrile disorders and hemorrhages. In acute rheumatism it is given in large doses with great benefit. Some physicians prescribe as much as one, two, or three ounces, largely diluted with water, to be given in the course of 20 hours; but as in several cases a single ounce has proved fatal in a few hours, the effects of such large doses should be carefully watched. It is a popular remedy in sore throat, either in the form of niter balls, or powdered and mixed with white sugar. In either case the remedy should be retained in the mouth till it melts, and the saliva impregnated with it gently swallowed. The inhalation of the fumes produced by the ignition of *touch-paper* often gives speedy relief in cases of spasmodic asthma.

Nitrate of potash is sometimes called *prismatic niter* or *potash saltpeter*, to distinguish it from nitrate of soda, which is known in commerce as *cubic niter* or *soda saltpeter.*

Cubic niter, or *nitrate of soda* (NaO,NO_5), occurs abundantly on the surface of the soil in Chili and Peru. It derives its name from its crystallizing in cube-like rhombohedrons. In most of its properties it resembles ordinary niter, but in consequence of its greater deliquescence it cannot be substituted for that salt in the preparation of gunpowder. Being considerably cheaper than the potash-salt, cubic niter is often substituted for it in the manufacture of nitric and sulphuric acids; and it is used in agriculture as a top-dressing for wheat and oats. In several experiments it has been found that one cwt. per acre has produced an increase of 12 bushels in the wheat crop, and of 4 or 5 sacks in the oat crop.

NI'TI-GHAUT, a pass of the Himalaya, between the British district of Kumaon and Thibet. It takes its name from the village of Niti, in Kumaon, 13 m. s. of the pass, in lat. 30° 47′ n., and long. 79° 56′ east. The pass is 16,814 ft. above the level of the sea. This is regarded as the easiest pass between Kumaon and Thibet, and is consequently one of the principal channels of trade between Hindustan and Chinese Tartary. The Bhotias of Niti subsist chiefly by the carrying of goods in this trade. The articles of merchandise are conveyed on yaks, goats, and even sheep. Travelers often suffer much from difficulty of respiration on the pass of Niti-Ghaut, on account of the rarefaction of the air.

NI'TRATE OF POTASH. See NITER.

NITRATE OF SODA. See NITER.

NITRATES are salts formed by the union of nitric acid with bases. Some are found in a natural mineral condition, as saltpeter and cubic niter. They are distinguished for their solubility in water. On being heated, they undergo decomposition, being converted either into free nitric acid and a base, or into oxygen and a nitrite. For potassium nitrate and sodium nitrate, see NITER, *ante.* In many respects, one of the most important nitrates is the nitrate of silver, or lunar caustic (q.v.); see also SILVER, *ante.* It is of great use in surgery and the arts. As a caustic it acts powerfully, but rather superficially, producing a white slough, which blackens soon on exposure to the light. It is used in a solid state, or in solutions of all strengths. If dissolved in pure water, it remains colorless; but the smallest particle of organic matter will cause the solution to turn dark. On this account it is employed for making marking-fluids for linen. Indelible ink is usually made by dissolving 1 part of nitrate of silver and 4 parts of gum-arabic in 4 parts of water, and adding a little India ink to give it color, so that it may be seen when the mixture is applied. The place which is to receive the impression is first moistened with a solution of carbonate of soda and dried. After the application of the ink, the writing is exposed to the sunlight. Lunar caustic markings may be readily removed by applying a few drops of tincture of iodine, and dissolving out the iodide of silver thus formed by a solution of hyposulphite of soda, or a dilute solution of caustic potash. Nitrate of silver is used in photography (q.v.). Nitrate of ammonia, or ammonic nitrate (according to modern nomenclature, ammonium nitrate), NH_4O,NO_5, or, according to later views, NO_3NH_4, may be formed by the action of the galvanic current on a mixture of nitrogen and oxygen with an excess of hydrogen; but the common method is to add a slight excess of aqua ammonia to nitric acid. If crystallization is conducted slowly, six-sided prisms, like those of nitrate of potash, will be formed, having a specific gravity of 1.635. It melts at 226° F., and at 482° decomposes into water and nitrous oxide, or laughing-gas. See NITROGEN, *ante.* Nitrate of baryta, or baryta saltpeter, is made by treating the native carbonate of baryta with nitric acid. It crystallizes in anhydrous regular octahedrons, having a specific gravity of 3.184. When heated strongly it is converted into baryta, or baric oxide, with evolution of oxygen and nitrogen. Nitrate of bismuth and also sub-nitrate are important salts in the arts and medicine. See BISMUTH, *ante.* Nitrate of cobalt, prepared by the action of nitric acid on the oxide, crystallizes from solutions in beautiful pink-red deliquescent crystals, having a specific gravity of 1.83. It is much used in the chemical laboratory, particularly as a blow-pipe reagent. With magnesium compounds, it yields a pink color; with those of zinc, green; and with aluminum compounds a beautiful blue; for this reason it is much used in coloring porcelain and earthenware. Nitrate of copper is made by the action of diluted nitric acid on copper turnings. Nitric oxide gas is given off during the operation. It crystallizes from cold solutions in beautiful blue, deliquescent, rhomboidal prisms, containing four molecules of water. From solutions above 59° it crystallizes with three molecules of water in needles, having a specific gravity of 2.047, soluble in alcohol. Nitrate of copper is converted, by moderate heat, into an insoluble basic nitrate. By raising the heat, the acid is completely driven off, leaving only the black oxide of the metal. Nitrate of copper is sometimes useful in surgery, as an application to certain ill-conditioned ulcers. The nitrates of iron are important salts. The protonitrate, or ferrous nitrate, is formed by digesting iron-turnings in very dilute nitric acid. It crystallizes in pale green rhombohedrons, having the formula $Fe(NO_3)_2.6H_2O$. It is much used in dyeing. The pernitrate, or ferric nitrate, is made by dissolving iron-turnings in nitric acid of sp. gr. between 1.2 and 1.3. It is used in surgery. Nitric acid forms several salts with lead, the principal of which is the common nitrate, or plumbi nitrate, $Pb(NO_3)_2$. It crystallizes in anhydrous regular octahedrons, usually milk-white and opaque. It dissolves in 7½ parts of cold water. It is decomposed by heat, with evolution of peroxide of nitrogen. Nitric acid forms a greater number of salts with mercury than with any other metal, one of which is used in medicine (see MERCURY, *ante*), and the other for the manufacture of corrosive sublimate.

NITRIC ACID is the most important of the five compounds which oxygen forms with nitrogen (q.v.). Until 1849 it was only known in the hydrated form (the *aquafortis* of the older chemists), but in that year Deville showed that *anhydrous nitric acid*, or *nitric anhydride* (NO_5), might be obtained in transparent colorless crystals by the action of perfectly dry chlorine gas on well-dried crystals of nitrate of silver, the reaction being exhibited in the equation:

$$\overset{\text{Nitrate of silver.}}{AgO,NO_5} + \overset{\text{Chlorine.}}{Cl} = \overset{\text{Chloride of silver.}}{AgCl} + \overset{\text{Nitric anhydride.}}{NO_5} + \overset{\text{Oxygen.}}{O.}$$

It is a very unstable compound, and sometimes explodes spontaneously. It dissolves in water with evolution of much heat, and forms hydrated nitric acid.

Hydrated nitric acid (symb. HO,NO_5, equiv. 63, sp. gr. 1.521), when perfectly pure, is a colorless, limpid, fuming, powerfully caustic fluid, possessing an intensely acid reaction, as shown by its action on litmus. It boils at 184°, and freezes at about −40°. It parts very readily with a portion of its oxygen to most of the metals, and hence is much used in the laboratory as an oxidizing agent. Its mode of action on the metals requires a few remarks. In order that a metal should unite with nitric, or any other acid, it is necessary that it should be in the form of an oxide. This oxidation is, however, effected at the same time that the metal and nitric acid are brought in contact, by one portion of the latter becoming decomposed and converting the metal into an oxide, while the remaining portion combines with the oxide thus formed, to produce a nitrate. The exact nature of the decomposition varies in the case of different metals.

Nitric acid, whether in the concentrated or in a more dilute form, acts energetically on organic matters. As examples of such actions, we may refer to its power of decolorizing indigo; of staining the skin and all albuminous tissues of a bright-yellow color; of coagulating fluid albumen; and of converting cotton fiber into an explosive substance. See GUN-COTTON.

The monohydrated acid (HO,NO_5) is by no means a stable compound. If it be exposed to the action of light it is decomposed into hyponitric acid (NO_4) (the peroxide of nitrogen of Graham) and oxygen; and mere distillation produces a similar effect. When it is mixed with water it emits a sensible amount of heat, owing to the formation of a much more stable hydrate, $HO,NO_5, + 3Aq$, which distils at 250° without change, and is unaffected by exposure to light. Its specific gravity is 1.424; and it is found that a weaker acid when heated parts with its water, and a stronger acid with its acid, till each arrives at this density. The existence of this hydrate has, however, been recently called in question by Roscoe.

The so-called *fuming nitric acid* is merely a mixture of the pure acid with hyponitric acid.

Nitric acid does not occur naturally in a free state; but it is found tolerably abundant in combination with potash, soda, lime, and magnesia; and after thunder-storms traces of it, in combination with ammonia, are found in rain-water. It may be formed in small quantity by passing a series of electric sparks through a mixture of its component gases in the presence of water, which is a mere imitation, on a small scale, of the mode in which it is produced in the atmosphere by a storm. It is usually prepared in the laboratory by the application of heat to a mixture of equal weights of powdered niter (nitrate of potash) and oil of vitriol (hydrated sulphuric acid) placed in a retort. A combination of sulphuric acid and potash remains in the retort, while the nitric acid distils over, and is condensed in the receiver, which is kept cool by the application of a wet cloth. The reaction is explained by the equation:

$$\overset{\text{Niter.}}{KO,NO_5} + \overset{\text{Sulphuric acid.}}{2(HO,SO_3)} = \overset{\text{Nitric acid.}}{HO,NO_5} + \overset{\text{Bisulphate of potash.}}{KO,HO,2SO_3.}$$

During distillation red fumes appear, arising from the decomposition of a portion of the nitric acid and a formation of some of the lower oxides of nitrogen. In this operation *two* equivalents of oil of vitriol are taken for *one* of niter, these being the proportions found by experience to be most suitable. If they are taken, equivalent for equivalent, a very impure red fuming acid is the result. In the manufacture of nitric acid on the large scale, the glass retort is replaced by a cast-iron cylinder coated with fire-clay, and the receiver by a series of earthen condensing vessels connected by tubes; and nitrate of soda, found native in Peru, is substituted for niter, in consequence of its being a cheaper salt, and of its containing 9 per cent more nitric acid.

Nitric acid combines with bases to form *nitrates*, some of which, as those of potash, soda, oxide of ammonium, silver, etc., are anhydrous, while others combine with a certain number (often six) equivalents of water of crystallization. Most of them are soluble in water, crystallizable, and readily fusible by heat; and at an elevated temperature they are all decomposed, usually leaving only the oxide of the metal. If paper be soaked in a solution of a nitrate, allowed to dry, and ignited, it burns in the smoldering mode characteristic of *touch-paper*. This property is, however, shared by a few other salts.

The tests for this acid when it is present in small quantities are less satisfactory than those for the other ordinary mineral acids. All its compounds are so soluble that no *precipitant* for this acid is known. The best method for its detection is mixing the fluid to be tested with a little concentrated sulphuric acid, and then pouring a strong solution of protosulphate of iron upon it, so as to form a separate layer. If much nitric acid be present, a black color is produced; if only a small quantity is present the liquid becomes reddish-brown or purple; the dark color being due to the formation of nitric oxide by the deoxidizing action of a portion of the iron salt on the nitric acid.

The applications of this acid in the arts, in manufactures, and in chemical processes are very extensive.

NITRIC ACID, The Medicinal Uses of. In the British pharmacopœia there is both a strong and a dilute acid. The strong acid has a specific gravity of 1.5, and is represented by the formula $3HO,2NO_5$, while the diluted acid is prepared by mixing two ounces of the former with thirteen of distilled water, and has a specific gravity of 1.101.

The dilute acid is used internally as a tonic in conjunction with bitter infusions. In many cases of chronic inflammation of the liver, and in syphilitic cases in which the employment of mercurials is inadmissible, it may be prescribed with great benefit, either alone or in conjunction with hydrochloric acid, externally as a bath or lotion, or internally in doses of about 20 minims properly diluted. The strong acid is useful as an escharotic; as to destroy warts, some kinds of polypi, the unhealthy tissue in sloughing ulcers, etc., and as an application to parts bitten by rabid or venomous animals. Largely diluted, as 50 or 60 drops of the strong acid to a pint or more of water, it forms an excellent stimulative application to torpid ulcers.

NITRITES, salts produced by the action of nitrous acid on bases. The principal metallic nitrites are those of potassium, sodium, barium, ammonium, copper, lead, and nickel. The common mode of preparation is to reduce the nitrites by heat. The alcoholic nitrites or nitrous ethers are of more practical interest than the metallic salts. Nitrite of amyl is an inflammable liquid having the odor of pears; sp.gr. 0.877; boiling-point, 196° F. It is formed by the action of nitrous acid upon amylic alcohol. Its inhalation greatly increases the action of the heart, followed by loss of power. If has the power of suspending respiration and producing a condition of trance, which may stop short of death. In experiments upon animals, the appearances after death differ with the mode of administration. When given rapidly the lungs and brain are not congested; left side of heart empty, but right side filled with blood. When given slowly, both sides of the heart contain blood, and the lungs and brain are also congested. For nitrite of ethyl see Nitrous Ether, *ante*.

NI'TRO-BEN'ZOL, or Nitro-Benzide ($C_{12}H_5NO_4$), is a yellow oily fluid, of specific gravity 1.2, which may be distilled without decomposition, crystallizes in needles at 37°, and boils at 315°. It has a sweet taste, is insoluble in water, but dissolves freely in alcohol and ether. Its odor is very similar to that of oil of bitter almonds, which has led to its use in perfumery, under the name of *essence of nirbane*. It is obtained by treating benzol ($C_{12}H_6$) with warm fuming nitric acid, when 1 equivalent of the hydrogen is replaced by 1 of hyponitric acid, so that the benzol ($C_{12}H_5H$) becomes converted into nitro-benzol ($C_{12}H_5NO_4$).

NI'TRO-BEN'ZOL. [*From Supplement.*] This substance has recently taken a prominent place amongst the narcotic poisons. Under the name of *essence of nirbane*, it is largely employed as a substitute, in perfumery and confectionery, for oil of bitter almonds, which it closely resembles in smell, and to confectionery it gives the smell, but not the agreeable taste of that oil. It is a pale, lemon-colored liquid, with a pungent, disagreeable taste, and distinguishable by its odor from all other liquids except oil of bitter almonds, from which it differs in the following reaction: Pour a few drops of each on a plate, and add a drop of strong sulphuric acid. The oil of almonds acquires a rich crimson color with a yellow border, while the nitro-benzol produces no such color. In 1859 prof. Casper of Berlin published an account of this liquid under the name a "A New Poison," and described its effects on dogs and rabbits. In 1862 and since that date various cases of human poisoning have been published, both in this country and abroad. We shall briefly notice three cases, in two of which the patient died after swallowing a portion of the fluid; while in the other the inhalation of the vapor proved fatal. A boy aged 17, while drawing off some nitro-benzol by a siphon, swallowed a portion of the liquid. There were no immediate symptoms; but he soon felt sleepy, and when at dinner ate but little, and said he felt as if he was drunk. This was between two and three hours after he had swallowed the liquid. He fell into a stupor, which became deeper and deeper, until death took place, without vomiting or convulsions, twelve hours after the ingestion of the poison. In the case of a man aged 43, who spilled a quantity of nitro-benzol over his clothes, and went about for several hours breathing the vapor, the effects were nearly the same. The progress of each of these cases, both of which are described by Dr. Letheby in the *Proceedings of the Royal Society* for 1863, was much the same as that of slow intoxication, excepting that the mind was perfecting clear until the coming on of the fatal stupor, which was sudden, as in a fit of apoplexy. From that moment there was no return of consciousness or bodily power; the sufferer lay as in a deep sleep, and died without a struggle. The duration of each case was nearly the same, about four hours intervening between the swallowing or inhaling of the poison and the beginning of stupor or coma, which lasted five hours. Nitro-benzol, as well as aniline, into which it seems to have been partly converted in the body, was detected in the brain and stomach. It is unnecessary to describe the steps to be taken for the detection of the poison in all these cases, no one but a professed toxicologist should be intrusted with an investigation on the result of which the life and character of a human being may depend. It is satisfactory to read Dr. Taylor's opinion, that "there is no probability that this liquid will be successfully employed for the purposes of murder without the certainty of detection."—*Principles and Practice of Medical Jurisprudence*, p. 311. It is worthy of notice that the vapor of this substance, as it is evolved from almond glycerine soap, has seriously affected females; and Dr. Taylor mentions the case of a gentleman who, from using a cake of the soap in taking a warm bath, fainted from the effects of the vapor, and was ill for some months afterwards. The mode of treatment that should be adopted in poisoning by this substance is essentially the same as that which should be adopted in poisoning by opium.

NITROGEN (symbol, N; equiv. 14; sp. gr. 0.9713) derives its name from the Greek words *nitron*, niter, and *gen-*, to produce, in consequence of its being an essential constituent of that salt. It is frequently termed *azote* (Gr. *a*, priv., *zoe*, life), especially by the French chemists, in consequence of its being a gas incapable of supporting life, and for the same reason the German chemists term it *stick-stoff* ("choking substance"). It was discovered by Rutherford in 1772. Long regarded as a "permanent" gas, it was liquefied by Cailletet in 1878.

Nitrogen is a colorless, tasteless, inodorous, permanent gas, which in its appearance in no way differs from the atmospheric air, of which it is the main ingredient. It is somewhat lighter than atmospheric air, 100 cubic in. at 60° F., and barometer 30 in., weighing 30.119 grains, while the same volume of air weighs 30.935 grains. It is characterized rather by negative than by positive properties. It is not combustible, nor is it a supporter of combustion (a lighted taper being immediately extinguished if immersed in this gas); it is not respirable, although it is not positively poisonous; for when it is mixed with respirable gases (as with oxygen in atmospheric air) it may be breathed without injury. It is very sligthly soluble in water, and hence may be collected over that fluid. Its combining powers are very slight, and although it unites with oxygen, hydrogen, chlorine, and many other substances, the union is never effected by the direct action of the elements on one another, but only by complicated processes, and many of the resulting compounds are of an exceedingly unstable nature.

Nitrogen is one of the most widely diffused elementary substances. It forms about four-fifths of the bulk of the atmosphere; for air, after having been freed from the small quantities of carbonic acid and aqueous vapor which it contains, consists, according to the experiments of Dumas and Boussingault, of 20.81 per cent of oxygen and 79.19 per cent of nitrogen by volume, or 23.01 of oxygen and 76.99 of nitrogen by weight; the two gases in this case being uniformly mixed, but not in chemical combination with one another. It occurs, however, in combination with oxygen in the form of nitric acid (HO,NO_5) in various nitrates, which are found as natural products in many parts of the globe. In combination with hydrogen it is abundantly found as ammonia, and combined with oxygen, hydrogen, and carbon, and sometimes additionally with sulphur and phosphorus, it forms the most important constituents of the solids and fluids of the animal body, and occurs in many vegetable products, especially in the alkaloids, such as morphia, strychnia, quinia, etc.

The ordinary methods of preparing and exhibiting this gas are based upon the removal of the oxygen from atmospheric air. This may be done: (1) By setting fire to a small piece of phosphorus placed in a capsule that floats on the water of the pneumatic trough, and by inverting a glass-receiver filled with air over it. The phosphorus combines with the oxygen of the air to form phosphoric acid, which dissolves in the water, while the nitrogen is left, and must be transferred to another vessel. (2) By placing a stick of phosphorus in a jar of air which is standing over water. In two or three days there will be the same results as in the former experiment—viz., phosphoric acid and nitrogen. (3) Or by passing air through a tube containing heated copper filings, which absorb the oxygen. In the above cases a little carbonic acid is present, which may be removed by passing the gas through a solution of potash. Pure nitrogen may be directly obtained by the action of chlorine gas on a solution of the nitrogenous substance, ammonia.

Nitrogen forms with oxygen no less than 5 distinct compounds, containing, respectively, 1, 2, 3, 4, and 5 equivalents of oxygen, with 1 equivalent of nitrogen. These compounds are thus named and constituted: Protoxide of nitrogen (known also as nitrous oxide and laughing gas), NO; binoxide (or deutoxide) of nitrogen (known also as nitric oxide), NO_2; nitrous acid, NO_3; hyponitric acid (known also as peroxide of nitrogen), NO_4; nitric acid, NO_5.

Protoxide of nitrogen is a transparent, colorless gas, with a sweetish taste and smell. It is much more soluble in cold than in hot water, and therefore should be collected over the latter. Under a pressure of 50 atmospheres at 45° it is reduced to a colorless liquid, and it may be frozen into a transparent solid at about — 150°. This gas is about half as heavy again as atmospheric air, its specific gravity being 1.527. It supports the combustion of many bodies, such as carbon, sulphur, phosphorus, and iron, with a brilliancy similar to that which they exhibit in oxygen; and, like oxygen, when mixed with hydrogen, it forms a mixture which explodes on the application of a flame. The most remarkable property of the gas is its intoxicating power on the animal system. It may be respired for a short time if quite pure, or if only mixed with atmospheric air, without danger or serious inconvenience. The intoxication is frequently accompanied with an irresistible propensity to muscular exertion, and usually with uncontrollable bursts of laughter, and hence the gas has received the name of *laughing gas*. It is best obtained by heating solid nitrate of ammonia in a glass retort, when it is converted into protoxide of nitrogen and water. It has recently come into frequent use as an anæsthetic in dentistry and similar cases. It is less suited to protracted operations, as the effects are transient. It produces much less disturbance of the system than chloroform.

Binoxide of nitrogen is a colorless gas, very slightly soluble in water, and having a specific gravity of 1.039. Its taste and smell (if any) are unknown, since, in the presence of atmospheric air, it instantly becomes more highly oxidized, and forms yellowish-red fumes of hyponitric acid. As it is of little importance, it is unnecessary here to describe the mode of obtaining it.

Nitrous acid, or *nitrous anhydride*, is a substance of which, in its uncombined state, very little is yet known further than that it is a dark-blue, very volatile fluid, which boils at 32°, and is then converted into an orange-red gas.

Hyponitric acid presents a remarkable example of a body within comparatively small limits of temperature, occurring in a solid, a fluid, and a gaseous form. At a temperature of —4° it occurs in the form of colorless prismatic crystals, which are converted at about 9° into a fluid which, till the temperature reaches about 30°, is colorless; but at a higher temperature becomes yellow and orange, and at about 82° boils, and is converted into a brownish-red vapor. It is chiefly the vapor of hyponitric acid that forms the orange fumes that are produced when binoxide of nitrogen comes in contact with the air. It possesses a very disagreeable suffocating odor, and a caustic action, and colors the skin yellow, like nitric acid. It does not enter into combination with bases but is immediately decomposed by them into nitric and nitrous acids; and it is in consequence of its not possessing this essential character of an acid that Graham has given it the name of *peroxide of nitrogen*, a term that has since been adopted by Miller and other chemists.

Nitric acid is described in a special article.

Nitrogen combines with hydrogen in four proportions, but none of these compounds can be formed by the direct union of the component elements, and only one of them, viz., ammonia, has been obtained in the isolated form. They are—*imidogen* (NH), *amidogen* (NH_2), *ammonia* (NH_3), and *ammonium* (NH_4). Of these, the first two will be noticed under ORGANIC BASES, while the last two are sufficiently described under AMMONIA.

Nitrogen combines with chlorine, bromine, and iodine. The *chloride of nitrogen* is a heavy, oily, orange-colored fluid, insoluble in water, and evolving a vapor of a highly irritating nature. It is one of the most dangerous compounds known in chemistry, as it explodes with extreme violence when brought in contact with phosphorus, arsenic, potash, ammonia, caoutchouc, numerous oily matters, etc., at ordinary temperatures, and spontaneously when heated to above 200°. It has occasioned so many serious accidents that we shall omit all details regarding its mode of preparation. Its exact formula is unknown. *Bromide of nitrogen* is an oily-looking detonating liquid, resembling the chloride in appearance and properties. *Iodide of nitrogen* occurs as a black powder, which when dry explodes upon the slightest touch, and often without assignable cause.

Nitrogen enters into combination with various metals, as mercury, copper, titanium, molybdenum, and vanadium, forming a class of compounds to which the term *nitrides* is applied. Their most marked characteristic is that, like the preceding set of compounds, they are highly explosive, resolving themselves when struck, or at a high temperature, into their constituent elements.

NITRO-GLYCERINE [$C_6H_5N_3O_{18}$, or $C_6H_5(NO_4)_3O_6$], known also as *glonoin* or *glonoin oil*, is a compound which is produced by the action of a mixture of strong nitric and sulphuric acids on glycerine at low temperatures. Two methods of preparing it are given in Watts's *Dictionary of Chemistry*, vol. ii., pp. 890, 891, to which we must refer the reader who seeks for details on this subject. According to whatever method it is prepared, it is obtained as a light yellow oily liquid, of specific gravity varying from 1.525 to 1.6, inodorous, but having a sweet, pungent, aromatic taste; a single drop, however, if placed on the back of the tongue, produces headache and pain in the back, which last for many hours. It is only slightly soluble in water, but dissolves readily in ether, alcohol, and methylated spirits. This substance was discovered in 1847 by Sobrero, then a student in the laboratory of Pelouze in Paris, and afterwards professor in Turin. But though its discoverer ascertained its remarkable properties as an explosive, it remained simply an object of scientific interest till 1864, when it began to be manufactured on a large scale for blasting purposes by Nobel, a Swede resident in Hamburg. If ignited in the open air, nitro-glycerine burns rapidly and with a brisk flame, without any explosion; if poured out in a thin sheet, it ignites with difficulty, and burns incompletely. But it explodes at once if it is exposed to a moderately strong blow or concussion, to the concussion due to the explosion of gunpowder, to contact with red-hot iron, and especially to the action of detonating mixtures and fulminates; it likewise explodes on exposure to a high temperature (see below); the explosion, however it is produced, being in all cases excessively rapid, and unaccompanied by smoke. It is this explosive power that renders this compound a useful agent in blasting. According to Dr. Rudolf Wagner, the distinguished Bavarian technologist, it may be cooled down to 4° without becoming solid; but this statement probably refers to the chemically pure compound: for the nitro-glycerine of commerce, which was patented by the first maker, under the name of *Nobel's Patent Blasting Oil*, becomes solid if exposed for a considerable time to a temperature of 46°, crystallizing in long needles, which are most dangerous to handle, since they explode, even on being gently broken, with appalling violence. At 320°, nitro-glycerine begins (according to Dr. Adriani) to decompose, giving off red vapors; and if the heat be suddenly applied, or slightly raised above this point, the substance explodes with great violence; while, according to other observers, it is liable to explode at 240°, or a little higher; and if exposed for a length of time to half that temperature, explosion may take place at 180° or less. It is obvious from the formula for nitro-glycerine that it may be assumed to consist of glycerine, $C_6H_8O_6$, in which three atoms of hydrogen are replaced by three of peroxide of nitrogen, NO_4. The products of the complete combustion of 100 parts of pure nitro-glycerine are—water, 20 parts; carbonic acid, 58; oxygen, 3.5; and nitrogen, 18.5; and hence it has been calculated that one volume (say, a cubic inch) of this compound, at a specific gravity of 1.6, yields, on combustion or explosion:

Aqueous vapor, ...	554	volumes (say cubic inches)	
Carbonic acid, ...	469	"	"
Oxygen, ...	39	"	"
Nitrogen, ...	236	"	"
	——	"	"
	1298	"	"

According to Nobel, these gases expand, on explosion, to 8 times their bulk; in which case, one cubic measure (say, one cubic inch) of nitro-glycerine will yield 10,384 cubic measures (say, cubic inches) of gases; while one cubic measure of gunpowder will only yield 800 cubic measures of gases. Hence, it follows that, for equal bulks, nitro-glycerine is 13 times as strong as gunpowder, while for equal weights it is 8 times as strong.

The danger of using this compound in mining, etc., is greatly increased by its instability. Even when pure, it is liable, at a heat of 70° or less, to undergo slow, spontaneous decomposition into glycerine, oxalic and hydrocyanic acids, ammonia, etc., with a continuous escape of gaseous products, which, exerting pressure on the liquid, renders it so prone to explosion that even a slight concussion is attended with danger; and the impure commercial compound decomposes far more rapidly than the pure nitro-glycerine; indeed, impure nitro-glycerine may, from this cause, be regarded as "dangerously self-explosive even while standing quietly" (Adriani, *op. cit.*).

Many of our readers doubtless recollect the history of a terrific explosion that took place on board the ship *European*, when lying in harbor at Colon, Panama, on April 3, 1866. Amongst the cargo put on board at Liverpool were 70 cases of nitro-glycerine, and one case containing 70,000 percussion caps. At 7 A.M., on the 3d, a most tremendous explosion occurred in the after part of the ship. It was described as most rapid, without smoke, but with a great flame, and the ship was immediately after seen to be on fire. The whole of the deck and cabin aft were carried away, and the side of the ship was also much damaged, the plates above the water line being blown away, and the parts below it being much injured. For fear of further explosion, the ship was towed into the bay, where she shortly sunk. Nor was the injury confined to the *European*: the jetty was nearly blown away, and a vessel lying on the other side of it was much damaged. Houses in the town were also partially destroyed, the floors in many cases being torn up; and altogether about 50 lives were lost. When the bodies were recovered, they presented no sign of smoke nor any symptoms of scalding; and hence it was inferred that the explosion could not have been produced either by the percussion caps or by steam. On these and other grounds, the conclusion was irresistible that the explosion was due to the nitro-glycerine. An action was (Aug. 1867) brought at Liverpool by the owners of the *European* against the shippers of the nitro-glycerine, on the ground that no due notice of the dangerous properties of that compound had been given; and at this trial, several of the important points regarding the explosive properties of nitro-glycerine, which we have noticed, were elicited from prof. Abel, chemist to the laboratory at Woolwich; col. Boxer, superintendent of the Woolwich laboratory; and prof. Roscoe, who appeared as scientific witnesses. To give some definite idea of the explosive force of this substance, prof. Roscoe stated that one case of it would have sufficed for the destruction of the *European*. It is used to a considerable extent in the slate quarries in Wales, and in mining operations. A workman at one of those quarries described how he had been set to clean a wagon which had held some of it, which he did by scraping it with a piece of slate; and inadvertently throwing the piece of slate into the wagon when he had finished, the percussion exploded the remnants of the oil, and the wagon was blown to pieces. He states that it is regarded as ten times as powerful an explosive agent as gunpowder.

We learn from a number of the *Nevada Gazette* (quoted in the *Chemical News*, Aug. 16, 1867), that this substance was very advantageously employed in the blasting necessary for the construction of the summit tunnel on the Central Pacific railway. The operation is said to have been carried on 25 per cent faster than if powder had been used. The small holes required for the oil can probably be drilled in less than one-third the time required for the larger ones necessary in using powder. The oil does much more execution than powder, as it always breaks the rock from 2 to 16 in. beyond the hole, and also throws out a much larger body. The oil was estimated as having, in hard rock, a strength five times greater than powder. It was made upon the spot, and was considered much stronger as well as safer than the imported compound. After having been used for several months, there had been no accident, nor had a single blast missed fire since the Chinamen commenced filling the cartridges. Col. Schaffner of the U. S. army published an official report on this compound, to which he gives the name of "nitroleum," which confirms the fact that its explosive properties are far greater than those of gunpowder. From a report on the same subject by capt. Grant, R.N., it appears that it is exploded by percussion, and apparently, under ordinary circumstances, by nothing else —neither by friction nor fire. Generally a trifling blow is sufficient to explode it. Its explosive force is about ten times that of gunpowder. It has all the appearance of common oil, and is usually carried in tin cases, each of which holds 25 lbs. Each can is packed in a wooden case for carriage. In a paper on this subject by M. Kopp, that chemist holds the view already noticed, that accidents are mainly due to the presence of impurities. He states that, by means of charges of 1500 or 2000 grams of oil, from 40 to 80 cubic meters of a hard rock may be detached.

We have already noticed Richter's observations on the slight inflammability of this compound; and as the employment of this explosive agent seems to be increasing, we shall give his other chief results, so as to bring up our knowledge to the latest possible date. The shaft in which the experiments were made was being sunk 30 ft. long by 8 ft. wide, in hard gray gneiss with occasional joints, which facilitated the working. From these experiments it appeared not only that its power was four or five times greater than that of the nitrate-of-soda gunpowder commonly used for mining purposes in Germany, but that other advantages accrued from its use, which may be summed up as follows: (1.) Fewer men are wanted for working out a certain-sized piece of ground, and fewer holes have to be bored than at present. (2.) Nitro-glycerine does not take fire easily (see above). (3.) The amount of smoke after a blast is small, as compared with that of powder; and workmen can return at once to the spot when the blast has taken place. (4.) Holes that have missed, or only partly torn, can be retamped and shot off, which, with the present arrangements, is impossible, or very dangerous. Against these advantages must be set off the following disadvantages: (1.) The gases formed during the explosion of nitro-glycerine have an injurious effect on the organs of sight and respiration. (2.) Nitro-glycerine explodes on being struck smartly, and easily freezes. (3.) The masses of rock which it removes are mostly very large, and considerable time has to be spent in breaking them up.

In another set of experiments, the relative cost of blasting by nitro-glycerine and gunpowder was compared, and it was found that a cubic fathom of ground could be removed by the former for £4 0s. 4d.; the cost amounted to £5 0s. 9¾d. when the latter was used. In sinking a shaft in clay-slate by means of nitro-glycerine, the cost was under £3 per cubic fathom. For further details regarding these experiments the reader is referred to the *Chemical News*, Nov. 15, 1867, which contains a translation of Richter's valuable memoir.

DYNAMITE, called by the miners of Colorado and Nevada the "giant powder," has of late years superseded the nitro-glycerine which is its principal component. Induced by the calamitous and inexplicable accidents that so often attended the use of nitro-glycerine, and which it seemed impossible to guard against, Nobel sought, by soaking various inert substances with nitro-glycerine, to obtain some composition which should have the valuable powers of the explosive oil without its deadly risks. In 1867 he gave the name of dynamite to the successful outcome of his experiments. Dynamite, as generally manufactured, consists of infusorial earth, porcelain earth, coal-dust, siliceous ashes or the like, saturated with about three times its weight of nitro-glycerine—though the proportion varies with different makers. According to its elements, it is to the eye a grayish-brown, reddish, or blackish powder, damp and greasy to the touch, and without smell. In the open air it burns quietly, and gives off fumes of carbonic acid and nitrogen with a watery vapor. If properly made, it ought not to be exploded by heat up to 212°, by a spark, or by any ordinary shock; though cases are said to have occurred where one of these causes singly has sufficed. In order to take advantage of its enormous blasting power, it is pretty tightly packed in paper or parchment cartridges, and exploded by means of a fulminating fuse or cap. It leaves a white ash, with little or no smoke. In the hands of careful workmen who know what they are about, its use is comparatively free of danger, and it may be easily transported. It is now regarded as one of the safest of explosives, though its manufacture is still attended with great risks. Over gunpowder it has the advantage that it is not injured by damp; it also saves labor, fewer and smaller holes sufficing in blasting operations. It costs about four times as much as gunpowder, but performs eight or ten times as much work. The violence and rapidity of its explosion renders dynamite unfit for use in fire-arms. It is reckoned that in 1875 at least 100,000 cwts. of dynamite were manufactured in Europe.

Various other nitro-glycerine powders or compounds have been patented. *Dualline* is said to consist of wood gunpowder soaked with the oil; or of nitro-glycerine, fine sawdust, and a little niter. The improved *lithofracteur* contains 52 parts of nitro-glycerine, 30 of silex, 12 of coal-dust, and 2 of sulphur. Colonia powder, fulminatine, lignose, sebastine, heracline, are all names for compositions in which nitro-glycerine is the chief ingredient, and are all more or less valuable as explosives.

NITRO-MURIATIC ACID, is a mixture of nitric and hydrochloric acids. On account of having the power of dissolving gold, the king of metals, it was called *aqua-regia*. Hydrochloric acid does not possess the power of dissolving gold, or in other words the metal has not sufficient power to take the chlorine from the hydrogen. In the presence of nitric acid, however, the oxygen of which appears to have a decomposing influence upon the hydrochloric acid, the gold steps in, so to speak, and bears off the chlorine. Platinum also requires the action of *aqua-regia* to enable it to combine with chlorine. Chlorine in a nascent state (just liberated from combination) has more power to combine with gold or platinum than after it has been collected; its power is also increased by the polarized condition of the molecules of all the elements present. It is not only useful in chemistry, but has been employed in medicine with great benefit in certain cases of disease of the liver, administered internally, and also as a bath, diluted with large quantities of water.

NITROUS ACID. See NITROGEN, *ante*.

NITROUS ETHER, or NITRITE OF OXIDE OF ETHYL, is represented by the formula C_4H_5O,NO_3, or AeO,NO_3, Ae being the symbol for ethyl (C_4H_5). It is a pale yellow fluid, having a specific gravity of 0.947, and evolving an agreeable odor of apples. On evaporation, it produces a great degree of cold, it boils at 62°, and it is very inflammable. It does not mix with water, but is readily miscible with alcohol. When kept in contact with water it soon decomposes, and an acid mixture of a very complicated character is formed. It may be obtained by mixing 1 part of starch and 10 of nitric acid in a capacious retort, which must be gently heated. The vapor of nitrous acid which is evolved by the action of the starch on the nitric acid, is conducted into alcohol, mixed with half its weight of water, contained in a two-necked bottle, which is to be plunged into cold water. The second neck of this bottle is connected with a good cooling apparatus; and the vapor combining in its passage through the alcohol with the oxide of ethyl, forms nitrous ether, which distils in a continuous stream. This, which is known as Liebig's method, is the best process, but it is usually prepared by the direct action of nitric acid on alcohol, in which case the nitric acid is deoxidized by the hydrogen and carbon of the ethyl of part of the alcohol.

The *spirit of nitrous ether*, or *sweet spirit of niter*, used in medicine, is a mixture of nitrous ether with about four times its volume of rectified spirit. Its specific gravity should not exceed 0.85. It is used, in conjunction with other medicines, as a diuretic, especially in the dropsy which follows scarlatina; and it is employed, in combination with acetate of ammonia and tartarized antimony, in febrile affections. The dose in febrile cases is from half a dram to a couple of drams, and if we wish it to act as a diuretic, two or three drams should be given. It is a rather expensive medicine, and consequently is extremely liable to adulteration. In the new British pharmacopœia it is recommended that this substance should be directly obtained by the distillation of nitrite of soda (five ounces), sulphuric acid (four fluid ounces), and rectified spirit (two pints)—a process open to many practical objections.

NITROUS OXIDE, or LAUGHING GAS. See NITROGEN (protoxide) *ante*.

NITZSCH, KARL IMMANUEL, one of the most distinguished theologians that modern Germany has produced, was b. Sept. 21, 1787, at Borna. He studied for the church at Wittenberg, where he took his degree in 1810, and where, in 1818, he became parish minister. Here his religious opinions underwent a great modification, through the influence of Schleiermacher and Daub, and he awoke to a clearer perception of the essence of religion. From this time forward Nitzsch is to be regarded as one of that new school—of which Neander is the greatest representative—who endeavored to reconcile faith and science, not by forced and unnatural methods, but by pointing out their distinctive spheres, and by exhibiting in their own spiritual life that union of reason and reverence for which they argued in their writings. In 1822 Nitzsch was called to Bonn as ordinary professor of theology and university preacher, where he labored with great diligence for more than twenty years, not only in theology, but in all matters affecting the welfare of the Prussian church. In 1847 he succeeded Marheineke at Berlin, and as professor, university preacher, and upper consistorial councilor, he exercised with prudence and moderation a wide ecclesiastical influence. In his political (perhaps also in his religious) views he may be classed with the late chevalier Bunsen. The high Lutheran party having denounced liberal politics as irreligious, Nitzsch and Bunsen and others have vindicated them on the ground of Christianity, not without success. In theology his position will be best understood when we say that he subordinated dogma to ethics, or rather that he believed the only dogmas which can hope to permanently maintain themselves are those that result from an ethical apprehension of Christianity. Besides numerous smaller treatises on dogmatics, the history of dogmas and liturgies, three larger works call for special mention. These are his *System der Christlichen Lehre* (Bonn, 1829; 6th edit. 1851); his *Praktische Theologie* (Bonn, 1847–48); and his *Predigten*, or sermons, of which several collections have appeared, and which are remarkable for their extraordinary richness of thought. He died in 1868. NITZSCH, GREGOR WILHELM (born in 1790), brother of the preceding, acquired a high reputation as a philologist, and was professor of archæology at Leipsic till his death in 1861. He was considered one of the ablest opponents of Wolf's Homeric theories. His chief work is *Die Sagenpoesie der Griechen* (Brunswick, 1852).

NIVELLES (Flem. *Nyvel*), a t. of Belgium, in the province of Brabant, 18 m. s. of Brussels. It has a fine church, called the church of St. Gertrude (built in the Romanesque style of architecture, 1048 A.D.), which claims to contain the relics of St. Gertrude, daughter of Pepin, Maire du Palais. They are deposited in a shrine placed over the high altar. Nivelles has manufactures of linen, cotton, lace, etc. Pop. in 1870 about 9,300.

NIVERNAIS, formerly a province in the middle of France, nearly corresponding to the present department of Nièvre. It was divided into eight territorial districts, and its towns enjoyed municipal privileges at a very early period. The principal landowners were the counts, afterwards dukes, of Nevers, who held under their vassalage more than 1800 fiefs.

NIX, in the masculine, and *nixe* in the feminine (Old High Ger. *nihhus;* Anglo-Saxon, *nicor;* Dutch, *nikker;* Old Norse, *nikr;* Swed. *näk, nek;* Dan. *nök, nok*—whence our name for the devil, *Nick*, not as some absurdly suppose, from *Nicholas* Machiavelli), the common name for all water spirits in the Teutonic mythology. They are represented as of human form, or sometimes as passing into that of a fish or of a horse. They love music and dances, and possess the gift of prophecy, like the Greek muses, sirens, and other water-gods. The nix taught, in return for a good gift, the art of playing on a stringed instrument; and often in the evening sunshine the nixes, combing their long hair, were wont to mingle in the dances of mortals; but their company was dangerous, for though sometimes wearing a mild appearance, they were more frequently cruel and malignant. The *water-kelpie* of Scotland must be reckoned a member of the genus nix, but in him the evil element alone exists. He generally, if not always, assumed the form of a water-horse; frequented fords and ferries, especially during storms; allured travelers to mount him, and then dashed furiously with them into the stream which he had flooded by his devilish power, and submerged them in the roaring currents.

NIZAM'S DOMINIONS, an extensive territory in the interior of Southern India, lying to the n.w. of the presidency of Madras, in lat. 15° 10′ to 21° 42′ n., and long. 74° 40′ to 81° 32′ east. Length from s.w. to n.e, 480 m.; extreme breadth, 340 miles. Area, 90,000 sq.m., and population estimated at 9,000,000. The surface is a slightly-elevated table-land. The principal rivers are the Godavari (Godavery), with its tributaries the Dudhna, Manjera, and Pranhita; and the Kistna (Krishna), with its tributaries the Bimah and Tungabhadro. The soil is naturally very fertile, but poorly cultivated; yet, wherever it receives moderate attention, it yields harvests all the year round. The products are rice, wheat, maize, mustard, castor-oil, sugar-cane, cotton, indigo, fruits (including grapes and melons), and all kinds of kitchen vegetables. The pasturages are extensive, and sheep and horned cattle are numerous. Marsh and jungle, however, occupy a great space, and originate fevers, agues, diseases of the spleen, etc., though the climate is quite healthy where these do not abound. The mean temperature of the capital, Hyderabad, in January is 74° 30′, and in May 93°. The inhabitants manufacture for home use woolen and cotton fabrics, and export silk, dressed hides, dye-stuffs, gums, and resins. Good military roads traverse the territory. The revenue of the nizam is reckoned at £1,550,000 yearly. The ruler is a Mohammedan, but his subjects are mostly Hindus.

In 1687 the territory, now known as the Nizam's Dominions, became a province of the Mogul empire; but in 1719 the governor or viceroy of the Deccan, Azof Jah, made himself independent, and took the title of *nizam-ul-mulk* (regulator of the state). After his death, in 1748, two claimants appeared for the throne, his son Nazir Jung, and his grandson Mirzapha Jung. The cause of the former was espoused by the East India company, and that of the latter by a body of French adventurers under gen. Dupleix. Then followed a period of strife and anarchy. In 1761 nizam Ali obtained the supreme power, and after some vacillation signed a treaty of alliance with the English in 1768. He aided them in the war with Tippoo, sultan of Mysore, and at the termination of that war, in 1799, a new treaty was formed, by which, in return for certain territorial concessions, the East India company bound itself to maintain a subsidiary force of 8,000 men for the defense of the nizam's dominions. The nizam remained faithful to the British during the mutiny of 1857–58. The territory is frequently called Hyderabad or Haidarabad. A British resident advises the nizam.

NIZH'NI-NOVGOROD'. See NIJNI-NOVGOROD, *ante*.

NIZH'NI-TAGILSK'. See NIJNI-TAGILSK, *ante*.

NOAH, 3115–2065 B.C., a son of Lamech, remarkable in character, deeds, and history. He was just in his dealings with men, pious in his relations to God, and preserved his uprightness in the midst of abounding and defiant wickedness. The great things in his life are recorded only in outline, and as such are familiar to all readers of the Bible. 1. He was a preacher of righteousness. 2. He built the ark (see ARK). 3. He and his family were brought safely through the flood, in which all the rest of mankind were drowned. 4. After the flood he commenced anew the work of cultivating the ground and planted a vineyard, the wine from which led to the one sin recorded against him, producing dishonor to himself and occasioning transgression and punishment among his descendants.

NOAH, MORDECAI MANUEL, 1785–1851; b. Philadelphia; studied law, removed to Charleston, S. C., was appointed consul at Riga 1811, and at Morocco 1813. Returning to the United States in 1816, he edited the *National Advocate*, a New York democratic paper, till 1826, when he founded the *New York Enquirer*, afterwards merged in the *Courier and Enquirer*.. He established the *Evening Star* in 1834, but soon withdrew from connection with the daily press, and became one of the founders of the weekly *Sunday Times*. He held at various times the offices of sheriff of New York co., surveyor of the port of New York, and judge of the court of sessions. He was a Jew, adhered to the Jewish religion, and attempted to found a Jewish colony on Grand island in the Niagara river. He wrote a number of dramas and other works.

NOAILLES, LOUIS MARIE, Vicomte de, 1756–1804; of an illustrious French family, b. in Paris, and associated with Lafayette (their wives were sisters) in the aid given to the American colonies in their struggle for independence. In 1789, at the opening of the French states-general, he was a deputy among the nobles representing Nemours, and on Aug. 4 made the memorable proposition for the abolition of titles and feudal privileges of all kinds, the interdiction of liveries, and the abolition of slavery in the dominions of France. During the excesses of the Jacobins he came to the United States, but returned to France as soon as the persecution of the old nobility ceased, and a few years later was made brig.gen. in San Domingo, where he died from wounds received in the capture of an English sloop of war near Havana by one of the most remarkable feats of naval *ruse* and daring on record.

NO'BILE OFFIC'IUM, the term used in the law of Scotland to denote the high prerogative right of the court of session to exercise jurisdiction in certain cases—as, for example, to appoint a judicial factor to young children or to lunatics.

NOBILITY, that distinction of rank in civil society which raises a man above the condition of the mass of the people. Society has a tendency to inequality of condition, arising from the natural inequality, physical, moral, and intellectual, of those who compose it, aided by the diversity of external advantages, and of the principles and habits imbibed at an early age. This inequality is apt to increase; the son, inheriting the faculties of his father, is more favorably situated than his father was for making use of them; and hence, in almost every nation, in even the very early stages of civilization, we find something like a hereditary nobility. Privileges originally acquired by wealth or political power are secured to the family of the possessor of them; and the privileged class come to constitute an order, admission into which requires the consent of society or of the order itself.

The ancient Romans were divided into *nobiles* and *ignobiles*, a distinction at first corresponding to that of patricians and plebeians. A new nobility afterwards sprung out of the plebeian order, and obtained (336 B.C.) the right to rise to high offices in the state; and in course of time the descendants of those who had filled curule magistracies inherited the *jus imaginum*, or right of having images of their ancestors—a privilege which, like the coat-of-arms in later ages, was considered the criterion of nobility. The man entitled to have his own image was a *novus homo*, while the *ignobilis* could neither have his ancestor's image nor his own.

The origin of the feudal aristocracy of Europe is in part connected with the accidents which influenced the division of conquered lands among the leaders and warriors of the nations that overthrew the Roman empire. Those who had acquired a large share of territorial possession, and their posterity to whom it was transmitted, were naturally looked on as the fittest persons to occupy the great offices of state and wield political power. The Frankish kingdom in Gaul was divided into governments, each under the authority of a chieftain called a count or *comes*—a designation derived from the *comes* of the Roman empire—whose Teutonic equivalent was *graf.* A higher dignity and more extensive jurisdiction was conferred on the *dux* or duke, a term also of Roman origin, and implying the duty of leading the armies of the country. In the Lombard kingdom of Italy, the same term was applied to the great officers who were intrusted with the military and civil administration of cities and their surrounding provinces. The marquises were guardians of the frontier marches. In the subinfeudations of the greater nobility originated a secondary sort of nobility, under the name of vavasours, castellans, and lesser barons; and a third order below them comprised vassals, whose tenure, by the military obligation known in England as knight's service, admitted them within the ranks of the aristocracy. In France the allegiance of the lesser nobles to their intermediary lord long continued a reality; in England, on the other hand, William the conqueror obliged not only his barons who held in fief of the crown, but their vassals also, to take an oath of fealty to himself; and his successors altogether abolished subinfeudation.

The military tenant who held but a portion of a knight's fee participated in all the privileges of nobility, and an impassable barrier existed between his order and the common people. Over continental Europe in general, the nobles, greater and lesser, were in use, after the 10th c., to assume a territorial name from their castles or the principal town or village on their demesne; hence the prefex "de," or its German equivalent "von," still considered over a great part of the continent as the criterion of nobility or gentility. Britain was, to a great extent, an exception to this rule, many of the most distinguished family names of the aristocracy not having a territorial origin. See NAME.

Under the feeble successors of Charlemagne, the dukes, marquises, and counts of the empire encroached more and more on the royal authority; and in course of time many of them openly asserted an independence and sovereignty with little more than a nominal reservation of superiority to the king. By the end of the 9th c. the Carlovingian empire had been parceled into separate and independent principalities, under the dominion of powerful nobles, against whom, in Germany, the crown never recovered its power. In France, however, the royal authority gradually revived under the Capetian race, the great fiefs of the higher nobility being one by one absorbed by the crown. In England, where the subjection of the feudal aristocracy to the crown always was, and continued to be a reality, the resistance of the nobles to the royal encroachments was the means of rearing the great fabric of constitutional liberty. All those who, after the conquest, held *in capite* from William belonged to the nobility. Such of them as held by barony (the highest form of tenure) are enumerated in *Domesday*. Their dignity was territorial, not personal, having no existence apart from baronial possession. The *comes* was a baron of superior dignity and greater estates; and these were in England the only names of dignity till the time of Henry III. The rest of the landholders, who held by other tenures than barony, also belonged to the nobility or gentry.

After the introduction of heraldry, and its reduction to a system, the possession of a coat of arms was a recognized distinction between the noble and the plebeian. In the words of sir James Lawrence (*Nobility of the British Gentry*): "Any individual who distinguishes himself may be said to ennoble himself. A prince judging an individual worthy of notice gave him patent letters of nobility. In these letters were blazoned the arms that were to distinguish his shield. By this shield he was to be known or *nobilis.* A plebeian had no blazonry on his shield, because he was *ignobilis*, or unworthy of notice. Hence arms are the criterion of nobility. Every nobleman must have a shield of arms. Whoever has a shield of arms is a nobleman. In every country of Europe, without exception, a grant of arms, or letters of nobility, is conferred on all the descendants." On the continent the term noble is still generally used in this sense; in England it is now more common to restrict the words noble and nobility to the five ranks of the peerage constituting the greater nobility, and to the head of the family, to whom alone the title belongs. Gentility, in its more strict sense, corresponds to the nobility of sir J. Lawrence and of continental countries. This difference of usage is a frequent source of misapprehension on both sides of the channel; at some of the minor German courts the untitled member of an English family of ancient and distinguished blood and lineage has sometimes been postponed to a recently-created baron or "herr von," who has received that title, and the gentility accompanying it, along with his commission in the army. It has been taken for granted that the latter belongs to the "adel" or nobility, and not the former.

The original higher nobility of Germany consisted of the dynasty nobles, i.e., the electoral and princely houses of the realm, with those counts and barons who had a seat in the diet or estates of the realm. These last have, since 1815, all been elevated to higher titles; most of the counts, in recompense for their acquiescence in the abolition of the German empire, receiving the diploma of prince, a title to which our dukes, marquises, and earls have also an undoubted right. The lower German nobility, corresponding to our gentry, were the merely titular counts and barons (i.e., those who had no seat in the diet), the edel-herren and banner-herren (something like our bannerets) the knights of the holy Roman empire, the "edlen von" (who now take the style of baron), and the common nobles distinguished only by the prefix "von." Throughout the middle ages the lesser nobility of Britain preserved a position above that of most continental countries, being, unlike the corresponding class in Germany, allowed to intermarry with the high nobility, and even with the blood-royal of their country.

The higher nobility, or nobility in the exclusive sense of England, consist of the five temporal ranks of the peerage—duke, marquis, earl, viscount, and baron) in the restricted signification of the word), who are members of the upper house of parliament. Formerly all the barons or tenants-in-chief of the sovereign were bound to attend his councils; but after the reign of Edward I. only a select number of them were summoned, the rest appeared by representatives—the former were considered the greater, the latter the lesser barons. See MINOR BARONS. In Scotland the whole barons continued to sit in parliament till a much later period; and after the minor barons attended only by representatives from their body, these representatives sat in the same house with the greater nobility, and, up to the union, their votes were recorded as those of the "small barrounis." By the act of union between England and Scotland the Scotch peers elect 16 of their number to represent their body in the house of lords in each parliament. The peers of Ireland, in virtue of the Irish act of union, elect 28 of their number to sit in the house of lords for life. The act of union with Scotland has been understood to debar the sovereign from creating any new Scotch peerages; all peers created in either England or Scotland between that date and the union with Ireland are peers of Great Britain; and peers created in any of the three kingdoms subsequently to the union with Ireland are peers of the United Kingdom, with this exception that one new peerage of Ireland may be created on the extinction of three existing peerages. When the Irish peers are reduced to 100, then, on the extinction of one peerage another may be created. All peers of Great Britain or of the United Kingdom have a seat in the house of lords. A Scotch peer, though not one of the 16 representative peers, is debarred from sitting in the house of commons, a disability which does not attach to Irish peers. The peerage is, from time to time, recruited by new additions, the persons selected being in general peers of Scotland or Ireland; younger members of the families of peers; persons distinguished for naval, military, political, or diplomatic services; eminent lawyers promoted to high judicial appointments; persons of large property and ancient family, noble in the more extended sense; and occasionally, but rarely, persons who have by commerce acquired large fortunes and social importance. At present the peerage comprehends about 555 individuals—the number of peerage titles being much greater, as several titles often merge in one person. Five royal dukes are included in this enumeration, as also 87 peers of Scotland and 183 of Ireland. Only 25 of the present Scotch and 89 Irish peers are without seats in the house of lords, in consequence of there being, besides the representative peers, 40 peers of Scotland and 80 of Ireland who are at the same time peers either of England, Great Britain, or of the United Kingdom. The privileges belonging to peers as members of parliament will be explained under PARLIAMENT; as peers, they also possess the following immunities: They can only be tried by their peers for felony, treason, or misprision of treason when the whole members of the peerage are summoned, and the accused is acquitted or condemned by the voice of the majority, given not on oath, but "on honor." This privilege, which extends to peeresses, either in their own right or by marriage, is in Scotland further regulated by act 6 Geo. IV. c. 66. A peer answers to bills in chancery upon his honor, and not on oath; but when examined as a witness in civil or criminal cases, or in parliament, he must be sworn. He cannot be bound over to keep the peace elsewhere than in the court of queen's bench or of chancery. Scandal against a peer is "*scandalum magnatum*," a more heinous offense than slander against another person, and subjects the offender, by various English acts, to statutory punishments. All the privileges belonging to the English peers, except the right of sitting in the house of lords, were extended to the peers of Scotland by the treaty of union. A peer who has different titles in the peerage takes in ordinary parlance his highest title, one of the inferior titles being given by courtesy to his eldest son. Certain courtesy titles (q.v.) belong also to the daughters and younger sons of a peer, but do not extend to their children.

In France a limited body of the higher nobility, styled the peers, were in the enjoyment of privileges not possessed by the rest. The title of duke was subject to strict rule, but many titles of marquis and count, believed to be pure assumptions, were recognized by the courtesy of society. The head of a noble family often assumed at his own hand the title of marquis; and if an estate was purchased which had belonged to a titled family, the purchaser was in the habit of transferring to himself the honors possessed by his predecessor—a practice to which Louis XV. put a stop. Immediately before the revolution 80,000 families claimed nobility, many of them of obscure station, and less than 3,000 of ancient lineage. Nobles and clergy together possessed two-thirds of the land. Practically the estimation in which a member of the French nobility was held depended not so much on the degree of his title as on its antiquity, and the distinction of those who had borne it. The higher titles of nobility were not borne by all members of a family; each son assumed a title from one of the family estates—a custom productive of no small confusion. Unlike "roturier" lands, which divided among all the children equally, noble fiefs went to the eldest son. The revolution overthrew all distinction of ranks. On June 18, 1790, the national assembly decreed that hereditary nobility was an institution incompatible with a free state, and that titles, arms, and liveries should be abolished. Two years later the records of the nobility were burned. A new nobility was created by the emperor Napoleon I. in 1808, with titles descending to the eldest son. The old nobility was again revived at the restoration. All marquises and viscounts are of pre-revolution titles, none having been created in later times.

Commercial pursuits have more or less in different countries been considered incompatible with nobility. In England this was less the case than in France and Germany, where for long a gentleman could not engage in any trade without losing his rank. A sort of commercial "Bürger-Adel," or half-gentleman class, was constituted out of the patrician families of some of the great German cities, particularly Augsburg, Nuremberg, and Frankfort, on whom the emperors bestowed coats-of-arms. In semi-feudal Italy there was on the whole less antagonism between nobility and trade than north of the Alps. The aristocracy of Venice had its origin in commerce; and though untitled, they were among the most distinguished class of nobles in Europe. On the other hand, in Florence, in the 14th c., under a constitution purely mercantile, nobility became a disqualification from holding any office of the state. In order to the enjoyment of civil right, the nobleman had to be struck off the rolls of nobility; and an unpopular plebeian was sometimes ennobled, in order to disfranchise him. A little later there grew up, side by side with the old nobility, a race of plebeian nobles—as the Ricci, the Medici—whose pretensions were originally derived from wealth, and who eventually came to be regarded as aristocrats by the democratic party.

Italian nobility has this peculiarity, that it does not, for the most part, flow from the sovereign, but from the municipal authorities of the towns acting in entire independence of him. The municipalities can confer nobility on whom they please, by inscribing his name in their respective *Libri d'oro.* The registers of nobility of most of the Tuscan towns are deposited in the *Archivio della Nobiltà*, or herald's office, at Florence—an institution created by the first sovereign of the house of Lorraine. The municipalities have, however, no power to confer titles, though at one time several persons, a few Englishmen included, on the strength of their names being in the *Libro d'oro* of Fiesole, assumed the titles of marquis, count, and baron—an abuse put a stop to by the late grand duke of Tuscany. In Rome there is a small number of nobles—as the Colonnas, Caetanis, and Orsinis—who hold their fiefs as sovereign princes; the rest of the nobility, many of them of very ancient lineage, are municipal, the power of creation being vested in the senator, himself a nominee of the pontiff, and the *Conservatori*, chosen by lot from the Capitoline nobles. In last century so many undistinguished persons had been added to the roll of nobility, that pope Benedict XIV. found it necessary to prohibit by a bull the admission of any one whose ancestors had not filled certain high offices in the state. The same decree limited the number of noble families to 187, designed the *Patriziato Romano*, out of whom 60 of the oldest and most illustrious were chosen as *Nobili Conscritti*, otherwise called the capitoline nobles, and restricted the admission to the patriziato for the future to persons who had rendered important services to the city, and whose names were approved by the *Congregazione araldica*, an exception being made in favor of members of the reigning pontiff's family. As the families of the conscritti became extinct, other patrician families, designated *Nobili Ascritti*, were added by the municipality to make up the number. The titles at present borne by the Roman nobility are: 1. Prince or duke, generally so called, but officially designed "barone Romano"—a title acquired by the Borghesi, Rospigliosi, and others from popes of their respective families; in the case of the Colonnas, Dorias, Odescalchi, etc., from royal or imperial erection; and in other instances—as the Caetani and Massimi—from investiture by the pope as a temporal sovereign. 2. Marquis and count; many of these are provincial nobles, with titles generally derived from small feudal tenures, of which, in some instances, it would be difficult to show the diploma, or point out the period of creation. In some parts of the Papal States it is understood that every head of a noble house is a marquis; and in the march of Ancona, Sixtus V. conferred the right to bear the title of count on all who were of noble blood at the period. 3. Knights (*cavalieri*), a designation given to all who wear a Roman order, to knights of Malta, and generally to younger sons of the titled nobility. 4. Princes, who, with the sanction of the pope, have purchased honors along with ancient fiefs, that carried with them ducal or princely titles, most of them *novi homines*, as the Torlonias. Titles do not descend to the younger members of the family; it is the general usage for the head of the house to bear the most ancient title, while the eldest son, on his marriage, assumes the second in point of antiquity. The title is sometimes the family name, sometimes the name of a feudal possession. The proper designation of the younger branches of titled families is "dei principi," "dei duchi," "dei marchesi," etc.

The nobility of Spain boasts of a special antiquity and purity of blood, a descent from warriors and conquerors alone, without the infusion of any of the elements derived from the church, law, and commerce that are to be found in other countries. "Hidalgo" (*hijo d'algo*, son of somebody, not *filius nullius*) is a term which implies gentility or nobility. The hidalgo alone has in strictness a right to the title "don," which, like "sir" of our knights and baronets, requires the adjunct of the Christian name. When the Christian name is omitted, the title "señor" instead is prefixed with the addition of "de." "Don" has latterly been used by persons who have no proper claim to it about as extensively as "esquire" in England. Hidalguia, till recently, conferred important privileges and immunities. The higher nobility are styled grandees; formerly the title was "rico-hombre," and the ceremonial of creation consisted in granting the right of assuming the pennon and caldron (*peñon y caldera*)—the one the rallying ensign of command, the other of maintenance of followers. In contradistinction from the grandees, the class of nobility below them are called "los Titulados de Castilla." Red blood is said to flow in the veins of the hidalgo, blue in that of the grandee. Formerly there were three classes of grandees, whose mark of distinction was this—that a grandee of the first class was entitled to put on his hat in the royal presence before the king spoke to him; the second, after the king spoke to him; the third, after the king had spoken and he had replied. The second and third classes are now absorbed into the first. Of the grandees, some bear the title of duke, some of marquis, some of count; but it is the ambition of every grandee to unite in himself as many grandeeships, or have as many *hats*, as the phrase is, as he can. This is effected by the marriage of heiresses through whom *grandeza* descends, and whose names and titles are assumed by their husbands. An enormous accumulation of titles is sometimes found in the person of one grandee. Titles as well as estates go only to heirs of entail. The titulars of Castile are designed "vuestra señoria;" in common parlance, "ucia." The title of baron is little used in Spain. Physically and mentally, the grandees have degenerated from their ancestors, and they have not the influence at court and in the country which landed property ought to give them. Most of them reside at Madrid, clinging to their nominal rank and real nullity, while they are practically excluded from all the functions of state.

In Russia what nobility existed before Peter the Great was of a patriarchal not a feudal kind; but in his anxiety to assimilate everything to a western standard, the czar took the existing aristocracies of states quite differently situated as the model to which to approximate the fortunate of his own subjects. The Russian nobles have ever since been enlarging their privileges by encroachments on those under them. Before Moscow was burned, the mass of the nobles connected with the court lived there in great splendor, and along with their domestic serfs constituted half the population of that city.

The preservation of noble blood, untainted by plebeian intermixture, has often been reckoned a matter of much moment. In Spain most of all this purity of lineage has been jealously guarded. In the German empire no succession was allowed to feus holding immediately of the emperor, unless both parents belonged to the higher nobility. In France the offspring of a gentleman by a plebeian mother was noble in a question of inheritance or exemption from tribute, but could not be received into any order of chivalry. Letters of nobility were sometimes granted to reinstate persons in this position. It is in Germany still important for many purposes to possess eight or sixteen quarterings, i.e., to be able to show purity of blood for four or five generations, the father and mother, the two grandmothers, the four great-grandmothers; and also, in case of the sixteen quarterings, the eight great-great-grandmothers, having all been entitled to coat-armor. Among the higher grades of the peerage in England, a considerable number may be pointed out who do not possess this complete nobility. It is in Scotland more usual and more regarded, both among peers and untitled gentry, where the eight or sixteen quarterings are still in use to be displayed on the funeral escutcheon. At some of the minor German courts, the sixteen quarterings were not unfrequently an illusion, diplomas being granted in the absence of a full pedigree, to declare the parties as noble as if they had had sixteen ancestors.

NOBLE, a co. in n.e. Indiana, intersected by the Lake Shore and Michigan Southern railroad, the Grand Rapids and Indiana, and the Chicago division of the Baltimore and Ohio railroad, with junctions at Kendallville and Avilla; 420 sq.m.; pop. '80, 23,007—21,495 of American birth, 47 colored. It is drained by Elkhart river and Blue creek. Its surface is largely prairie, with groves of building timber and sugar maple trees. Its soil is fertile and produces live stock, grain, dairy products, fruit, and maple sugar. Its most important industries are the manufacture of carriages, furniture, iron castings, leather, cigars, and harness. It has flour and saw mills, woolen factories, foundries, and machine shops. Co. seat, Albion.

NOBLE, a co. in s.e. Ohio, intersected by the Marietta, Pittsburg and Cleveland railroad, drained by Seneca and other small creeks; 400 sq.m.; pop. '80, 21,137—20,593 of American birth, 94 colored. Its surface is well timbered, and undulating; its mineral products are coal, limestone used for building purposes, petroleum, iron ore, and salt. Its soil is fertile. Live stock is raised; also tobacco, wool, grain, dairy products, and sorghum. It has flour and saw mills, and its most important industries are the manufacture of saddlery and harness, sashes, doors and blinds, and woolen goods. Co. seat, Caldwell.

NOBLE, Louis Legrand. b. in Otsego co., N. Y., 1811; educated in the Episcopal theological seminary of New York; rector in North Carolina till 1844; and afterwards at Catskill on the Hudson. He was literary executor of Thomas Cole, the landscape painter, and published a memoir of that artist, New York, 1853. In 1854 he was called to Chicago; in 1858 to Jersey City; in 1860 accompanied the painter Church to the Arctic regions; and published *After Icebergs with a Painter* in 1861. In 1874 he was made professor of the English language and literature at St. Stephen's college at Annandale on the

Hudson. A collection of his poems has been published under the title of *The Hours and other Poems,* 1857.

NOBLES, a co. in s.w. Minnesota, has the state line of Iowa for its s. boundary; 720 sq.m.; pop. '80, 4,435—3,384 of American birth. It is intersected by the Sioux City and St. Paul railroad. It is drained by the head-waters of the Des Moines, Rock, and Little Sioux rivers, and several lakes, lake Graham and Okabena lake being the largest. Its surface is rolling, poorly timbered, and has a soil adapted to the cultivation of grain. It embraces some of the highest land in the state, being in its s. portion 1607 ft. above the level of the sea. Some attention is paid to the raising of stock. Co. seat, Worthington.

NOBUNA'GA, 1533–82; b. Japan; a member of the Ota family, and son of a great landed proprietor. A civil war was raging in Japan at the beginning of his career, and he at first adhered to the shogun, but afterwards fought against and deposed him. He governed Japan, as vice-gerent of the mikado, till 1582, when he was attacked by one of his generals in his own residence, and committed suicide. He was bitterly hostile to Buddhism, and favored the Portuguese Jesuit missionaries, who came to Japan for the first time in his reign. Nobunaga was really hostile to the Jesuits also; but he used them to reduce the power of the bonzes. The Japanese Buddhist sects were then rich and powerful; they hired armies, and continually interfered in politics. In 1571 Nobunaga destroyed the great Buddhist monastery of Hiyeizan, where he burned several hundred temples, and killed all the bonzes and their adherents and families. Soon afterwards the fortified monastery of Ozaka surrendered to him. This persecution broke the power of Japanese Buddhism.

NOCE'RA, or NOCERA DEI PAGA'NI, a t. of s. Italy, in the province of Salerno, 8 m. n.w. of the town of Salerno, and on the highway from that town to Naples. It carries on linen and woolen manufactures. Pop. 8,519.

NOCTES AMBROSIANÆ, the fanciful name of a long series of critical, political, and poetical disquisitions in dialogue published in *Blackwood's Magazine,* and purporting to be the verbatim report of the meetings at Ambrose's tavern, Edinburgh, and elsewhere, of several of the literary celebrities of the day. They were almost entirely the work of "Christopher North," John Wilson (q.v.). The only foundation for the thread of connection and assumption of different personalities is that the first of the papers was written by Lockhart, after some such meeting at Ambrose's as is described. This was in 1822, and in 1825 Wilson began to publish the *Noctes* in regular succession. Of the seventy printed up to 1836, at least sixty are by his pen. For the part supposed to be taken by Hogg, the Ettrick Shepherd, there was no foundation in fact. The work is described by lord Cockburn as "a most singular and delightful outpouring of criticism, politics, and descriptions of feeling, character, and scenery. . . . . It breathes the very essence of the bacchanalian revel of clever men." The papers are not, however, free from the charge of coarseness, are very personal, bitterly and abusively tory, and have, of course, lost much of their interest from their local and ephemeral nature.

NOCTILIONIDÆ, a family of insectivorous bats, inhabiting tropical regions of both hemispheres. Their habits are not well known. The members of the genus *noctules* of South America are commonly known as "bull-dog bats" on account of their short thick muzzles, which in some species are cleft like the lip of a hare. The tail sometimes projects behind the membrane which connects the hind legs, and the claws of the hind-feet are large and strong. The length of the body is 4 or 5 in., and the spread of the wings about 18 inches. An East Indian genus, *dysopus,* has a spread of wing of two feet, and the hinder thumb is placed at a distance from the rest of the toes, similar to the arrangement in the quadrumana. In this genus the tail is short and the membrane connecting the hind legs is very small. The *cheiroptera* are variously classified. M. Lesson placed the *noctilionidæ* as a sub-family of *vespertilionidæ,* under the name *noctilionina,* consisting of ten genera—*noctilio, dysopes, molossus* (q.v.), *cheiromedes, nyctinomus, dinops, stenoderma, celæno, ællo,* and *scotophilus.* The frugivorous (fruit-eating) bats were also placed as a sub-family of vespertilionidæ (see BAT) by M. Lesson and others; but they are now usually classed apart, the order cheiroptera being divided into two sections, *insectivora* and *frugivora,* the insectivora comprising four families: *vespertilionidæ, rhinolophidæ, noctilionidæ,* and *phyllostomidæ* (see Phyllostoma in art. VAMPIRE; also SPECTER BAT, *ante*). The frugivora embrace only one family, the *pteropidæ* (q.v.), or the fox bats, including several genera. In the classification of Linnæus the vespertilionidæ were equivalent to our cheiroptera.

NOCTILUCINE, an organic substance supposed to be the cause of many of the phenomena of phosphorescence in fish, insects, and decaying matter. The name was given by Dr. Phipson, after a long series of investigations. Some of his earlier observations are mentioned in this work. See LUMINOSITY OF ORGANIC BEINGS, *ante.* Noctilucine has a syrupy consistence at ordinary temperatures, and a whitish color. It is said to be secreted in a pure form by the luminous centipede. Its spectrum is nearly monochromatic. Its luminosity appears to be owing to oxidation, and it is more luminous in ozone or allotropic oxygen than in normal oxygen. When moist it gives off carbonic acid as the result of oxidation. It is slightly soluble in water, but insoluble in alcohol and ether.

NOC'TULE, *Vespertilio noctula*, the largest British species of bat (q.v.), being nearly three inches long without the tail, which is fully an inch and a half. The ears are oval-triangular, shorter than the head: the muzzle is short and blunt. The noctule is only seen on the wing during a short part of the year, retiring early in autumn to hollow trees, caves, or under the eaves of buildings, where many are sometimes found together.

NOC'TURN (Lat. *nocturnum*, recited "by night"). Under the head Breviary (q.v.) has been explained the general order of the services of the canonical hours in the Roman Catholic church. The service of MATINS on Sundays and festivals is divided into three nocturns, each of which consists of three (or more) psalms and three *lessons*. The lessons are either from the Scriptures, from the life of a saint, or from a homily of some father. The name is derived from the recitation of the service "by night."

NODAWAY, a co. in n.w. Missouri, has the state line of Iowa for its n. boundary; intersected by the Nodaway river, forming its s.w. boundary; 900 sq.m.; pop. '80, 29,560—27,986 of American birth, 113 colored. It is drained by the One Hundred and Two and Little Platte rivers, and traversed centrally by the Kansas City, St. Joseph's, and Council Bluffs railroad. Its surface is uneven, having a good supply of timber, and lumber is one of its chief commodities. Its soil is fertile, and its inhabitants are principally engaged in farming and the raising of live stock. Its productions include Indian corn, wheat, oats, wool, pork, honey, and sorghum. Its leading industries are the manufacture of saddlery and harness, metallic ware, and bricks, and it has saw and grist mills. Co. seat, Maryville.

NODAL POINTS, LINES, AND SECTIONS. When a string or metallic cord, under strong tension, is made to vibrate, we hear, besides the principal sound, several secondary and shriller sounds; these are denominated harmonic sounds, and are produced each by a certain portion of the cord which vibrates independently. Further investigation has shown that every vibrating string is divided into a number of portions alternately vibrating in opposite directions, and that the points which separate these portions from each other are at rest. These points are known as *nodal points*, and their situation may be found by placing small pieces of paper on an extended string, and causing it to vibrate; the points from which the pieces of paper have not been displaced are the nodal points. If a plate of glass or metal be held in the hand, and a well-resined fiddle-bow be drawn across the edge, particles of fine dust, previously placed on the plate, will arrange themselves in lines, showing that along these lines no vibration has taken place; these lines are *nodal lines*, and are found in most cases to group themselves together into geometrical figures, and occasionally to present the most beautiful designs. The arrangement of the nodal lines depends on the point by which the plate is held, and on the form of the plate itself. Similarly, if a column of air in a wholly or partially closed tube be acted upon by the force of the breath applied through a hole at any point in its length, the column will divide itself into cylindrical portions each in a state of vibration, and separated from one another by transverse sectional portions in which the air is at rest; these latter sections are known as *nodal sections*.

NODDY, *Megalopterus* or *Anŏus*, a genus of birds of the family *laridæ*, differing from terns in having the bill slightly angular, thus exhibiting an approach to gulls, and the tail not forked but somewhat wedge-shaped. Only one species is known (*M.* or *A. stolidus*), a bird widely diffused both in the northern and southern hemispheres, and familiar to sailors, not only as often seen skimming over the water in quest of fishes, but also as not unfrequently alighting on vessels, and, particularly during the night, suffering itself to be taken by the hand. At its breeding-places also, where not accustomed to the visits of man, it scarcely gets out of the way, and the female sits undisturbed on the nest. Hence it commonly shares with the booby the reputation of unusual stupidity. It is about 15 or 16 in. long, from the tip of the bill to the end of the tail, the general color being a brownish-black. The noddy is a rare visitant of the British shores, but is very abundant in warmer latitudes; and on some of the *keys* of the West Indies, and other islets of different parts of the world, it breeds in immense numbers. Particular islets seem to be specially selected as the breeding-places of noddies; and there their nests are sometimes so closely placed that it is not easy to walk among them. Each nest generally contains three eggs about two inches long, which are very good to eat, and are in some places collected in great numbers.

NODES, in astronomy, are the two points in which the orbit of a planet intersects the plane of the ecliptic, the one through which the planet passes from the s. to the n. side of the ecliptic being called the *ascending node* (☊), and the other the *descending node* (☋). As all the bodies of the solar system, whether planets or comets, move in orbits variously inclined to the ecliptic, the orbit of each possesses two nodes, and a line drawn joining these two points is called the *line of nodes* of each body. It is scarcely necessary to add that, as the earth moves in the plane of the ecliptic, she has no nodes. The places of the nodes are not fixed points on the plane of the ecliptic, but are in a constant state of fluctuation, sometimes *advancing* (eastward), and at other times *receding* (moving westward). This motion is produced by the mutual attractions of the planets, which tend to draw each of them out of the plane of its orbit; and it depends upon the relative positions of the planets with respect to another planet whether that planet's nodes shall advance or recede. On the whole, however, the majority of possible "relative positions," or *configurations*, as they are called, is in favor of a retrograde motion; and we find by observation that, in an average of many revolutions round the sun, a constant retrogradation of the node takes place. The determination of this retrogradation in the case of the planets is a most complicated problem, as the separate action of each on the others has to be taken into account; but in the case of the moon's nodes, the immensely preponderating attraction of the earth, and its great relative magnitude as compared with the moon, enable us to throw out of account any other disturbing influence, and at the same time to exhibit clearly the cause of this motion of the nodes. Suppose the moon to have attained her greatest n. latitude, and to be descending towards the ecliptic, and the earth to be in longitude between her and her previous descending node, then the earth's attraction will tend to *depress* the moon's orbit, and cause her to descend to the plane of the ecliptic sooner than she would otherwise have done; in this case we have a retrogradation of the node. Again, supposing the moon placed as before, but the earth in advance of the line of nodes, then the earth's attraction will tend to draw the moon forward in her orbit so as to meet the ecliptic in a point beyond the previous descending node; in this case, the moon's node has advanced. As in the case of the planets, however, the retrograding tendency preponderates. The average annual retrogradation of the nodes is very small in the case of the planets, but considerable in that of the moon. See MOON. In calculating the courses of the planets, the "length" of the ascending node, or its distance in longitude from the vernal equinox, is a most important element. See ORBIT.

NODES, in botany. See STEM.

NODES are swellings, most commonly of an oblong form, which occur on superficial bones, such as the tibia, ulna, clavicle, and frontal bone, and are due to a syphilitic taint, to scrofula, or to rheumatism. Their immediate cause is the infiltration of lymph or serum into the periosteum, or between it and the bone. The treatment depends so essentially on the constitution of the patient, and the primary cause of the swelling, that it would be inexpedient to enter into any detail regarding it.

NODIER, CHARLES E., an eminent French litterateur, was b. at Besançon, April 29, 1783; other authorities give 1780 and 1781. His father was a distinguished lawyer, who warmly embraced the side of the revolution, and brought up his son in the same principles. At the age of 12 he was a member of the famous society of *Amis de la Constitution*, and hated tyranny with a most ideal and classical hatred: but he soon afterward became a royalist; then again, under Napoleon, a republican; and indeed during his whole career showed a want of that robust opinionativeness without which it is impossible for a man to become a genuine politician. He died—after a life of the hardest literary work, in which time, and even admirable talents, were wasted on inferior subjects—Jan. 27, 1844. Besides editions of the French classics, grammatical, lexicographical, and poetical works, he wrote numerous tales and memoirs. A portion of his writings was collected and published in 12 vols. at Paris, 1832–34, under the incorrect title of *Œuvres Complètes*.

NOÉ, AMADÉE DE. See CHAM.

NOEL, BAPTIST WRIOTHESLEY, The Honorable, 1799–1873; b. England; educated at Cambridge, and ordained in the church of England. He was appointed chaplain to the queen, and as pastor of St. John's chapel, London, became one of the most popular preachers in England. In 1848, having become a believer in immersion, he left the English church and was baptized, and became a Baptist minister. He defended his course in his *Essay on the Union of Church and State*, and in his treatise on *Christian Baptism*. Among his numerous works may be mentioned: *Sermons on the First Five Centuries of the Church*, 1839; *Protestant Thoughts in Rhyme*, 1845; *Christianity Compared with Unitarianism*, 1851; *Essay on the Duty of Englishmen to the Hindus*, 1858; and *Freedom and Slavery in the United States of America*, 1863.

NOE'TIANS. See PATRIPASSIANS.

NOGENT LE ROTROU, a t. of France, in the department of Eure-et-Loir, is situated in a pretty vale on the Huisne, 32 m. w.s.w. of Chartres. It is a station on the Great Western railway from Paris to Rennes in Brittany. Pop. '72, 5,884. Nogent le Rotrou is a long, well-built town, with a ruined castle in the Gothic style, the residence of the great Sully.

NOGGING. Brickwork built in the panels of a timber-framed house. Nogging-pieces are horizontal timbers, introduced to strengthen the brickwork.

NÓGRÁD, a co. in n.w. Hungary, touching the Danube on the s.w., and drained by the Eipel, which empties into the Danube, and the Zagyva, a tributary of the Theiss; 1685 sq.m.; pop. '70, 198,269, partly German. It is mountainous in the n. and, excepting a few fertile valleys, generally barren. Lumber, sheep-raising, and the manufacturing of woolen goods are the principal interests. Capital, Ballassa-Gyarmath.

NOILS, a technical term employed for the short and broken hairs which are removed from wool in the process of combing and preparing it for worsted manufactures. The *noils* are used for making inferior yarns, and are valuable for *felting* purposes, in which they are largely employed.

NOISE. See DEADENING OF NOISE.

NO'LA, an episcopal city of s. Italy, in the province of Caserta, 16 m. e.n.e. of Naples, is built on the site of one of the oldest cities of Campania. The ancient Nola was founded by the Ausonians, and fell into the hands of the Romans in the Samnite war, 313 B.C. For its protection, Marcellus in the second Punic war fought in its vicinity the first battles in which the Romans were victorious over Hannibal. Augustus died at Nola, 14 A.D. The first bells for Christian churches are said to have been cast here in the 5th century. See BELL. Numerous coins, and beautiful vases made of a pale-yellow clay, with figures painted in crimson and maroon, and supposed to have been manufactured here by potters from Corinth, have been found in the vicinity. Nola was a flourishing city in the middle ages, and has (1871) a pop. of 9,128, or with suburbs, 10,771.

NÖLDEKE, THEODOR, 1836–75; b. Germany; educated at Göttingen, where he manifested a taste for oriental studies, in which he soon became proficient. He was appointed professor in the university of Kiel in 1864, and remained there till 1872, when he was called to a chair at Strasburg. His studies were directed mainly to the Hebrew and Syriac languages, and to Arabian literature, and the history of Islamism. Among his works may be mention a *History of the Koran*, 1860; *Life of Mohammed*, 1863; *Contributions to a Knowledge of Ancient Arabian Poetry*, 1864; *The Literature of the Old Testament*, 1868; *Critical Researches on the Old Testament*, 1869; and *The Inscription of King Mesa of Moab*, 1870.

NO'LI ME TAN'GERÉ, a popular name for one form of the disease which has been already described under the term lupus (q.v.).

NOLLE PROSEQUI, a term used in English law to denote that the plaintiff does not intend to go further with the action, or part of the action, in which case he enters or files a memorandum, called a nolle prosequi, after which the action or part of the action is at an end on that point, and the defendant is entitled to his costs thereon.

NOLLE PROSEQUI, an entry upon the records of a court by the plaintiff in a civil, or the prosecutor in a criminal cause, declaring that the proceedings against the defendant shall be discontinued. In a criminal case a *nolle prosequi* may be entered at any time before a jury is impaneled without the defendant's consent, but not afterwards without his consent. A *nolle prosequi* is not equivalent to an acquittal, but acts merely as a stay of proceedings, and the defendant is liable at any time to be re-indicted. It may be entered as to one of several defendants, and is often done so to allow his testimony to be introduced against the others. It is generally in the discretion of the prosecuting officer to enter a *nolle prosequi*, but in some states leave must be obtained from the court.

NOLLEKENS, JOSEPH, was b. in London in 1737. His father, who was from Antwerp, and by profession a painter, died when he was young, and his mother, a Frenchwoman, not remaining long a widow, he received but little education. Being placed in the studio of Scheemakers, the sculptor, in Vine street, Piccadilly, he worked hard and made such progress that in 1759 the society of arts awarded him fifteen guineas for a group in clay; in 1760 thirty guineas for a bas-relief; and during the same year, ten guineas for a model in clay of a dancing faun. Soon after this Nollekens set out for Rome. He was then in his 23d year; his purse was light, he had no patron to support him; but he was independent in spirit, and had been trained to habits of economy. A bas-relief he carved in stone brought him ten guineas from England, and the society of arts voted him fifty guineas for his group in marble of Timoclea before Alexander. But one of the most important events for him, after settling in Rome, was his meeting Garrick in the Vatican, who immediately recognized his countryman as the young sculptor to whom the prizes had been awarded by the society of arts, sat to him for his bust, and paid him handsomely for it. This was the first bust he had been commissioned to model, and it gave him the opportunity of proving where his strength lay. He also executed in Rome a bust of Sterne in terra cotta, which added greatly to his reputation. After residing 10 years in Rome he returned to London, took a lease of extensive premises in Mortimer street, where he set up his studio; and the reputation he had acquired in Rome was such that he immediately had full employment, and within a year (in 1771) was elected an associate of the academy, and a royal academician the following year. His forte was in modeling busts. Into these he infused much truth and character, and he has handed down the likenesses of most of the important personages who figured in this country in the end of the last and at the commencement of this century—of Samuel Johnson, who was his friend and frequent visitor—of Fox, Pitt, and other political characters. George III. also sat to him; and his manner, which exhibited pretty strongly what is popularly set down as blunt and manly English character, made him a great favorite with the king. Besides busts, Nollekens executed numerous commissions for public monuments and statues. He was selected by the academy, with whom the choice lay, to execute the government commission of a monument to the three captains, Manners, Bayne, and Blair, who fell in Rodney's great battle of April 12, 1782; but in this he did not rise above the allegories of Neptune and his sea-horse, and Britannia and her lion. His statue of Pitt for Cambridge was much praised at the time. He also executed, either in the course of his studies, or to meet the views of those connoisseurs who advocate high art, a considerable number of classical and mythological statues and groups, a faun, a Bacchus, five Venuses, Cupid and Psyche, Pætus and Arria, etc. He died in London, April 23, 1823. His wife, to whom he had been long married, and who had brought him some fortune, died a few years before him. He had no children, and his great wealth, upwards of £200,000, was left to certain friends, burdened with some legacies and annuities to his old assistants and servants.—See Cunningham's *Lives of British Artists, etc.*

NO'MADS (Gr. *nemein*, to tend or feed), the name given (originally by the Greeks) to those tribes which, depending chiefly on their flocks and herds, have no fixed habitation, but move about for convenience of pasture. The nomad tribes are of a higher grade of civilization than those that live by hunting and fishing, but much inferior to those engaged in agriculture and manufactures. They are very generally addicted to robbery, and readily engage in aggressive war, so that they have frequently become conquerors of extensive cultivated countries, as in the instances of the Huns, Arabs, and Tartars. There are now few nomads in Europe, and these only in the steppes near the Black sea, and the regions of the utmost north, where cultivation is impossible. Almost all the Finnish, Mongolian, and Turkish tribes, and the tribes formed by mixture of these races, in the steppes and deserts of central and northern Asia are nomads, also the Kurds and the Bedouins, many of the tribes of Africa, and the Gauchos and some of the other Indian tribes in North and South America.

NOM'BRÉ DE DIOS, a t. of Mexico, 85 m. s.e. from Durango, in a mountainous district. Near it are rich silver mines. Pop. 7,000.

NOM'BRIL POINT, in heraldry. See ESCUTCHEON.

NOME, a term used in the ancient Greek music to denote any melody determined by inviolable rules.

NOMENCLATURE, CHEMICAL. See CHEMISTRY, *ante*.

NOMINALISM. This word refers to a celebrated controversy of the middle ages, respecting the nature of our general or abstract ideas. It was contended by some that abstractions—as a circle in the abstract, beauty, right—had a real existence apart from round things, beautiful objects, right actions. This was called realism. Those that held the opposite view were called Nominalists, because they maintained that there is nothing general but *names;* the name "circle" is applied to everything that is round, and is a general name; but no independent fact or property exists corresponding to the name. There is nothing in a general name, they say, but a declaration of resemblance among a number of things; all things that the name is applied to, resemble one another in some point, which point of resemblance the mind can consider apart from the points of difference; this act of isolated consideration being what is called the power of abstraction. We can be engaged in thinking of the smell of a rose, we can compare it with other sweet odors, and speculate as to the nature of the material that gives the odor, or as to the pleasure that we derive from it; all this is a process of abstract thinking, but it would not of itself suffice to prove that the odor has a separate existence. We might also confine our attention to the mere form, or outline of the rose, and compare it with other forms; but we should be still less able to affirm the independent existence of this particular form.

Realism must be traced back to Plato's system of ideas, or the eternal and independent existence of general attributes, from which the concrete embodiments were derived. There existed in the Divine Mind, according to Plato, patterns, models, or archetypes, according to which individuals were formed. The archetype circle was the origin of all actual round things. Aristotle denied the separate existence of these general forms, and held that they existed only in connection with matter, or with objects in the concrete. The Stoics repudiated universals in both senses. The Aristotelian view constituted the scholastic realism, and prevailed until the 11th c., when a re-action took place in favor of the Stoical doctrine, headed by Roscelin of Compiègne and John the sophist. This was the commencement of Nominalism. The celebrated Abelard was a disciple of Roscelin, and induced large numbers to depart from the realistic notions, which were identified at the time with religious orthodoxy. The controversy raged with great violence through the 12th century. Thomas Aquinas and Duns Scotus, in the following century gave their powerful adhesion to realism. In the 14th c. William Occam, an English Franciscan friar, and a pupil of Scotus, revived the advocacy of Nominalism, which was once more maintained by a number of eminent men, in spite of the hostility of the church, carried the length of persecution. The controversy subsided at the reformation.

A middle view between Nominalism and Realism was held by a few persons when the contest was at its height; which was, that although general properties have no separate existence in nature, they can be conceived in the mind apart from any concrete embodiment. Thus we may form an idea of a circle, irrespective of any individual round body. This view is specious, and is tacitly implied in many opinions that have never ceased to be held. See GENERALIZATION.

NOMINATIVE. See DECLENSION.

NON-APPEARANCE, the term used in the law of England to denote that a party against whom an action or suit has been commenced has not entered an appearance, which is the way by which he comes before the court to defend is right. In many cases, if he does not appear, the suit will go on in his absence, provided he was duly served with the writ of summons or bill.

NON-ASSUMPSIT, is in English law the usual plea or defense to an action for breach of a contract not by deed, and means that the defendant denies that he broke the contract, or that there was any contract.

NON-COMMISSIONED OFFICERS, in the British army, constitute a numerous and very important class in the regimental system between the commissioned officers and the men. As the former are not permitted to mix with the private soldiers, lest familiarity should diminish the sway of absolute discipline, it is necessary to have an intermediate class to overlook the men in their barracks and at all times when off the parade. None are so suited for this duty as the best conducted of the men themselves, who are promoted by selection to non-commissioned rank, and hold many privileges and powers unattainable by the privates. The non-commissioned officers comprise the sergeants-major, all the sergeants, the trumpeters, drummers, and buglers, and, in the life guards, and royal horse guards only, the corporals. They can be reduced to the ranks by sentence of a court-martial, or by their colonel-commandant; but not by a lieut.col. nor by any junior officer. Non-commissioned officers are entitled to quarters for their wives, or lodging-money in lieu of quarters. Accustomed themselves to obey, the non-commissioned officers are admirable assistants in preserving discipline; veterans, to whom military life is a second nature, they are looked up to by their comrades as examples, to lead in battle or to teach in drill. The non-commissioned officers have a mess (q.v.) to themselves. In a battalion of infantry at home, there were, in 1874, 58 non-commissioned officers to 520 rank and file; in India, 66 to 820; but the rank and file may be greatly augmented without affecting the number of non-commissioned officers. In the whole British army (European) for the year 1874–75, there were 20,949 non-commissioned officers. This rank is a necessity in all armies; in France, the non-commissioned officers are termed *sous-officers;* in Germany, *unter-offizieren.*

NON COMPOS MENTIS. See INSANITY, BEFORE THE LAW.

NONCONFORMISTS, a name sometimes given generally to all sectaries who, at any period in English history since the establishment of Protestanism, have refused to conform to the doctrine and practices of the Episcopal church. It is, however, more frequently used in a restricted sense to denote the 2,000 clergymen who in 1662—two years after the restoration—left the church of England rather than submit to the conditions of the act of uniformity, which required of every beneficed minister, every fellow of a college, and even every schoolmaster, unfeigned assent to all and everything contained in the book of common prayer. The ejected ministers swelled the ranks of the Presbyterians and Independents, the latter of whom are sometimes called Nonconformists.

NONE (Lat. *nona*, "ninth"), one of the lesser canonical hours (q.v.), so called from its recitation being primitively fixed at the ninth hour.

NON-EFFECTIVE (Fr. *non-activité*), is the term applied to the portion of the personnel of the army or navy not on active service or in immediate readiness for active service. It thus comprises all officers on retired or half-pay, pensioners, and superannuated officers. In a force liable to frequent augmentations and reductions, the non-effective charge must be considerable, and a large retirement is necessary, in order to rapid promotion. The great French war, also, with the reductions following it, bequeathed to the British an annual non-effective charge of several millions, which is not yet wholly expunged. In 1878–79, the non-effective charges were £2,344,912 for the army, and £1,887,571 for the navy, being upwards of 16 per cent on the gross cost of the two services.

NON-ENTRY, in the law of Scotland, means that state of a feudal estate when the last vassal has died, and his successor has not been invested or seized of the land. On such an occasion, the superior is entitled to what is called a casualty of non-entry, which consists of the rent of the feu.

NONES. See CALENDS.

NON EST INVENTUS, a technical term used in that part of the law where, after judgment, the sheriff endeavors to arrest a party. If after a reasonable search he cannot find the debtor, he makes a return to the court that he has not been able to find the debtor, which is shortly called a return of *non est inventus*, and his duty is then discharged until a fresh writ is issued to him.

NONFEASANCE, in certain parts of the law of England, means the not doing what one is bound to do.

NONJOINDER, in English law, is the omitting to join all the parties to the action or suit

NONJURORS, the name given to that portion of the Episcopal clergy of England who at the coronation of William and Mary refused to take the oath of allegiance to these sovereigns, believing that they had unlawfully possessed themselves of the throne abdicated by James II. They were great champions of the doctrine of passive obedience on the part of subjects towards kings; and as the triumph of the prince of Orange was obtained at the expense of that doctrine, it was impossible that they could, consistently with their antecedents, acknowledge him as their rightful king. The house of commons allowed them six months longer than laymen to make up their minds, but declined to adopt the amendment of the lords, viz., that the oath should not be imposed on the clergy. They refused, and were consequently deprived of their sees and benefices. The nonjurors comprised Archbishop Sancroft, 8 bishops, and about 400 of the inferior clergy.

NON-RESIDENCE, the name given in church law to the offense of a person holding a spiritual benefice, who absents himself, without legal justification, from the local precincts within which the duties attached to the benefice are prescribed to be performed. The obligation of residence follows clearly from every principle of law; and, from the constant tendency to relaxation on the part of the clergy, has been an unfailing subject of legislation, ecclesiastical and civil, from the very earliest times. The council of Nice in 325, of Antioch in 332, and of Carthage in 401; the constitutions of the popes from the earliest genuine document of that class, the novels of Justinian, the capitularies of Charlemagne—all speak the same language, and enforce it by the same penalties. During the mediæval period, and especially during the unhappy contest of the western schism, great abuses prevailed. The whole substance of the legislation of the Roman church on the subject, however, is compressed in the decrees of the council of Trent, which are mainly contained in the decrees of the XXII. and following sessions, "On Reformation." The decrees of the council regard all church dignitaries, and others charged with the cure of souls. Without entering into the details, it will suffice to say that for all the penalty of absence without just cause, and due permission, consists in the forfeiture of revenues, in a proportion partly varying with the nature of the benefice, partly adjusted according to the duration of the absence. For each class, moreover, a certain time is fixed, beyond which, during twelve months, absence cannot be permitted. The duty is imposed on persons named in the law of reporting to the ecclesiastical superiors cases of prolonged absence. The same legislation has been confirmed by most of the recent concordats, and is enforced by the civil law of each country. In England the penalties for non-residence are regulated by 1 and 2 Vict. c. 106. Under this act an incumbent absenting himself without the bishop's license for a period exceeding three, and not exceeding six months, forfeits one-third of the annual income; if the absence exceed six, and does not exceed eight months, one-half is forfeited; and if it be of the whole year, three-fourths of the income are forfeited. The persons excused from the obligation of residence by the canon law are sick persons, persons engaged in teaching the theological sciences in approved places of study, and canons in immediate attendance upon the bishop ("*canonici a latere*"), who ought not to exceed two in number. By the act 1 and 2 Vict. c. 106, heads of colleges at Oxford and Cambridge, the wardens of Durham university, and the head-masters of Eton, Westminster, and Winchester schools are generally exempted, and temporary exemptions from residence are recognized in other cases, which it would be tedious to detail. In the Roman Catholic church, besides the general legislation, most of the provincial and diocesan statutes contain special provisions on the subject of non-residence.

NONSUIT is a legal term in England, which means that where a plaintiff in a jury trial finds he will lose his case, owing to some defect or accident, he is allowed to be nonsuited, instead of allowing a verdict and judgment to go for the defendant. The consequence is that the plaintiff has to pay the defendant's costs; but he can bring a fresh action if he can get over the difficulty that rendered a nonsuit necessary or expedient.

NONSUIT (*ante*), may be voluntary, as where the plaintiff purposely absents himself in order to abandon his cause and allow a judgment for costs to be entered against him; or involuntary, when, on being called on the trial of the case, plaintiff fails to appear. A nonsuit is no bar to another action for the same cause. In many of the states, and in the U. S. courts, nonsuit cannot be given against a plaintiff who has already given evidence to support his claim, or against his consent, but in others, like New York, where there has been a final submission of the cause, and the evidence is not sufficient to uphold the action, nonsuit may be ordered; while in Alabama the courts cannot enter a nonsuit unless specially authorized to do so by statute. If a nonsuit be rendered on insufficient ground, plaintiff may move to have it set aside.

NOOR-ED-DEEN' MAHMOOD. See Noureddin Mahmûd, *ante*.

NOOSSA. See Moluccas.

NOOT'KA DOG, a large kind of dog, common in a domesticated state among the natives of the vicinity of Nootka sound. It has erect, pointed ears. It is chiefly remarkable for the extreme abundance of its long woolly hair, which, when shorn off, holds together as a fleece, and is spun and woven into garments. The introduction of this wool-bearing dog into other countries has been suggested, but not yet attempted.

NOOTKAS, or Ahts, a family of Indian tribes, in a province of the Dominion of Canada, on Vancouver island; they gave the name to Nootka sound, on the w. side of the island. They occupy a portion of the main-land near the island. The Ahts proper live on the w. side of the island, and number 3,500. Those called Nootka by capt. Cook are now said to be the Moouchahts. There are also the Quakewlth, subdivided into many tribes, on the w. and e. sides of the island, and on the main-land, which amount to as many more, and on the e. side of the island the Cowichans number 7,000. The god of the Ahts proper, and the one whom they worship as their progenitor, is Quawteaht; they also worship the sun and moon, and a bird, Totooch, which they believe to be endowed with supernatural powers. The laws governing the tribe are strict and peculiar, especially in regard to consanguinity. A brave cannot marry in his own clan, and the children are claimed by the mother's clan. One member of a clan cannot invite a member of the same clan to a feast; this rule applying to the male sex only, the squaws not being considered in society. They live in houses, the posts of which are set permanently at the stations habitually visited. The posts are set in a row for a distance of about 100 ft., and on either side, about 20 ft. from the central row, are two other rows, attached to it by string-pieces. These are covered with cedar slabs and mats, adjusted at will. Their canoes are convenient dug-outs, capable of transporting houses and household goods. Their chief occupation is fishing—catching salmon, herring, halibut, and occasionally whales. They travel for long distances to go on the hunt in the season, and add to their store by collecting shell-fish, camash roots, and sea-weed. They are ingenious in the manufacture of clothing, making capes of white pine bark, hats of cedar and pine bark, and blankets of cypress bark. They make their own dishes and dippers, of wood, and are accomplished in the art of carving. They wear masks on the war-path, which they carve out of wood, and they ornament their door-posts. They place their dead in boxes and hang them up in the trees or lay them on the ground, and cover them with mounds of sticks and stones. They have a bad reputation among the whites, who have greatly increased since the discovery of gold on the main-land. Their allies, the Cowichans, are partially civilized, doing their own farming and working for the whites; missionaries of all faiths have been encouraged to visit them, and have made a study of their language. A vocabulary of the Aht language is contained in Sproat's *Scenes and Studies of Savage Life*.

NOOTKA SOUND, an inlet on the w. coast of Vancouver island, British North America, in lat. 49° 35′ n., long. 126° 35′ west. Its entrance is protected by an island of the same name, and the sound can be entered on both sides of the island. It extends inland for 10 m. in a n.n.e. direction; but the greatest breadth of water is not more than 500 yards. Numerous small coves and inlets are found around the rocky shores. It affords good anchorage.

NORD, the most northerly department in France (whence its name), corresponding with the former province of French Flanders, and bordering on Belgium and the strait of Dover. Area 2,185 sq.m.; pop. '76, 1,519,585. It is composed of two parts, or at least narrows near the middle at Armentières, on the Lys, almost to a line. It is watered by the Scheldt and the Sambre, with their affluents, and by numerous canals. Next to that of the Seine, it is the most densely peopled department in France. The soil is fertile, well cultivated, and yields more abundant harvests than any other part of the country: 883,606 acres are arable. The principal products are wheat, hemp, beetroot, vegetables, tobacco, and fruits. Manufactures of lace, cambric, linens, and beetroot sugar are extensively carried on. It has a much larger proportion of railways, roads, and canals than any of the other departments, as well as the most important coal and iron mines. No other department has so many populous towns and strong fortresses; none adds so much to the national revenue; in none are the people so intelligent, so susceptible of culture, or so industrious. In respect of its educational and benevolent institutions, as well as of its learned societies, it ranks next to the department of the Seine. The arrondissements are Lille, Douai, Cambrai, Valenciennes, Avesnes, Hazebrouck, and Dunkerque. The chief town is Lille.

NOR'DEN, a t. of Prussia, in the province of Hanover, 72 m. n.w. from Oldenburg, and a few miles from the North sea, with which it is connected by a canal. Pop. '75, 6,130.

NORDENSKJÖLD, Adolf Eric, b. Finland, 1832; educated at Borgo and Helsingfors, and was appointed director of the faculty of mathematics and physics at the latter university, but removed for political reasons in 1855. In 1858 he became state mineralogist at Stockholm. He went with Torell in the Arctic expeditions of 1859 and 1861, and himself led expeditions in 1864, 1868, 1872, and 1875. The expedition of 1868 resulted in accurately fixing the position of Spitzbergen. In 1870 he made a scientific exploration of Greenland. His most important expedition was undertaken in 1878, for the purpose of exploring the n. polar sea from the mouth of the Yenisei e. to Behring strait. He left Gothenburg in July, 1878, and reached Yokohama in Sept., 1879. Nordenskjöld believes that his last voyage has demonstrated that communication by sea for commercial purposes may easily be had between Europe and the Obi-Yenisei; that the voyage from the Atlantic to the Pacific, in the Siberian sea, is practicable, but useless to commerce, and that further exploration is necessary to determine whether sea communication between the Pacific and the mouth of the Lena can be established.

NORDERNEY, a small island of the Prussian province of Hanover, lies 3 m. off the coast of East Friesland, and forms one of a string of islands that line that coast. Area about 4 sq.m.; permanent pop. 1770. It has enjoyed, since 1797, a great reputation as a place for sea-bathing, and in the summer season has from 1600 to 2,000 visitors. The little village at the w. end of the island has a very tastefully built *conversations-haus*, 130 ft. long. Trees do not grow here.

NORDHAUSEN, a flourishing t. of Prussian Saxony, pleasantly situated at the southern base of the Harz mountains, on the Zorge, 38 m. n.n.w. of Erfurt. The surrounding country is very fertile in corn, and in the vicinity commences the *Goldene Aue* (golden plain), a fertile valley watered by the Helme. It contains a gymnasium, numerous churches, one of which, St. Blasius, contains two pictures by Luke Cranach. It carries on a thriving general trade, is the depot from which the Harz mountains are supplied with necessaries, and has most extensive distilleries and considerable manufactures of tobacco, succory, chemicals, cloth, leather, etc. Its spirit-distilleries, of which there are 60 in almost constant operation, produce annually for export upwards of 100,000 hogsheads of corn-brandy. Pop. '75, 28,676.

NORDHEIMER, ISAAC, PH.D., 1809–42; b. Memelsdorf, Germany, of Jewish parents. Having acquired the rudiments of education at a Jewish school, he entered the gymnasium of Würzburg, to fit himself, by the study of the classics, theology, and philosophy, for a Jewish public teacher. After studying two years at the gymnasium, he was transferred to the university, from which, in 1832, he went to the university of Munich, taking his degree of doctor of philosophy in 1834. Two American students who took private lessons of him in 1832 having informed him that there were favorable openings in America, he left his home in 1835, and soon after his arrival in New York was appointed professor of Arabic and other oriental languages and acting professor of Hebrew in the university of New York. Soon afterwards he was appointed instructor in the Union theological seminary. He was one of the most eminent Hebrew scholars of modern times. He was intimate with Dr. Addison Alexander, Dr. Robinson, and prof. Stuart. On his way to this country he began the preparation of a Hebrew grammar on a philosophical basis. In 1838 he published the first volume, and in 1841 the second. Prof. Alexander, reviewing it, says, "This new work requires no painful effort of memory to keep its parts in order; the perusal in it of the most thorny part of Hebrew grammar opens a vista superior in clearness, extent, and beauty to that exhibited by any other writer. Nothing but the fear of being thought to deal in sweeping panegyric prevents our speaking in the highest terms." Horne styles it "the most elaborate and philosophical Hebrew grammar in the English language." Besides this he published *A Grammatical Analysis of Select Portions of Scripture, or a Chrestomathy; The Philosophy of Ecclesiastes, being an Introduction to the Book of Ecclesiastes*, in the *Biblical Repository*. He contributed other valuable articles to the *Biblical Repository*. He left also the following works in manuscript: *A Chaldee and Syriac Grammar*, in German; *Arabic Grammar*, in German; *A Larger Arabic Grammar*, in English; *A Translation and Exposition of the Book of Ecclesiastes*, in German; *Hebrew Concordance*, incomplete; *Philological Memoranda;* etc. Dr. Nordheimer continued through life in the Jewish faith.

NORDHOFF, CHARLES; b. Prussia, 1830; came with his parents to the United States in 1835, attended school at Cincinnati, and was apprenticed to a printer at the age of 13. He shipped in the U. S. navy in 1844, and during his service of three years made a voyage around the world. He stayed at sea till 1853, finding employment in the merchant, whaling, and mackerel fishery service. He was then engaged in Philadelphia, and afterward in Indianapolis in a newspaper office. From 1857 to 1861 he was employed by Harper & Brothers in an editorial capacity, and from 1861 to 1871 he was on the staff of the *New York Evening Post*. He visited California in 1871, and on a second trip in 1872 visited the Hawaiian islands. Since then he has been the Washington correspondent of the *New York Herald*, which position he still holds. Among the books he has written are *Man-of-War Life; The Merchant Vessel; Whaling and Fishing* (1856); *Stories of the Island World; Cape Cod and All Along Shore* (1868); *California for Health, Pleasure, and Residence; Northern California, Oregon, and the Sandwich Islands* (1874); *Politics for Young Americans* (1875); and *The Communistic Societies of the United States*. His books have been well received in America; some of them have been reprinted in England, and translations of them have been published in Germany.

NORDKÖPING. See NOERDKÖPING, *ante*.

NORDLINGEN, a t. in the w. of Bavaria, is situated on the river Eger, 44 m. n.w. of Augsburg by the Munich and Nuremberg railway. It has a Gothic church, with a high tower and fine organ, and manufactures of Tyrolese carpets, linens, and woolens, besides a large trade in feathers. Pop. '75, 7,224. Nordlingen is historically interesting as the scene of several battles, the most famous of which was fought, Sept. 6, 1634, between 24,000 Swedes, under count Horn and duke Bernhard of Saxe-Weimar, and 45,000 imperialists under king Ferdinand. The former were defeated with the loss of 12,000 killed and wounded, 300 banners and standards, 80 cannons, and several thousand prisoners, among whom was Horn himself.

NORE is a sand-bank in the estuary of the river Thames, 4 m. n.e. of Sheerness, on which there is a floating light, called the Nore light, in lat. 51° 29′ n., long. 0° 48′ west.

The name, however, is more commonly applied to the portion of the estuary in the vicinity of the Nore light and sand-bank.

NORFOLK, a co. in e. Massachusetts, bounded on the n.e. by Massachusetts bay; drained by the Charles and Neponset rivers; on the Old Colony, the Boston and Providence, and the Boston, Hartford, and Erie railroads; 500 sq.m.; pop. '80, 96,462—76,316 of American birth. The surface is diversified and hilly, and much of it heavily wooded with ash, elm, hickory, oak, and other timber trees. The soil is rocky, but fertile in many portions, producing Indian corn, oats, potatoes, etc. The Quincy quarries afford excellent granite. A large capital is invested in manufactures, and among the articles made are boots and shoes, leather, cotton, woolen, and straw goods, forged and rolled iron, carriages, harness, and metal wares. Co. seat, Dedham.

NORFOLK, a co. in s.e. Virginia, adjoining North Carolina, bounded on the n. and n.e. by Hampton roads and Chesapeake bay; drained by Elizabeth and North rivers and Deep creek; on the Atlantic, Mississippi and Ohio, and Seaboard and Roanoke railroads, and the Dismal Swamp canal; 450 sq.m.; pop. '80, 58,654—57,047 of American birth, 29,423 colored. The surface is level, and heavily wooded with cypress and other trees. A large part of the Dismal swamp lies within this county. The soil is sandy, and the principal productions are Indian corn, potatoes, and sweet potatoes. There are flour and saw mills, and manufactories of machinery, carriages, cars, and metal wares. Co. seat, Norfolk.

NORFOLK, a co. in s. Ontario, Canada; bounded on the s. by lake Erie; drained by tributaries of that lake; situated on the Canada Southern railroad; 635 sq.m.; pop. '70, 30,760, chiefly English, with a considerable admixture of Germans, Scotch, and Irish. The surface is mostly even, and the soil fertile. Co. seat, Simcoe.

NORFOLK, a large and important maritime co. of England, bounded on the n. and n.e. by the North sea, and on the s. by the county of Suffolk. Area 1,356,173 acres; pop. '71, 438,511. Its coast-line, extending from Yarmouth, on the e., to the mouth of the Nen in the Wash, is about 100 m. in length. From Yarmouth to Happisburgh the coast is low and sandy; from Happisburgh to Weybourne it is skirted by low cliffs; and w. of Weybourne to the entrance to the Wash, where the banks are in great part dry at low water, and where a considerable extent of land has been reclaimed from the sea (see WASH), it is low, and covered with sand or shingle. The surface of the county is level, or nearly so, none of the rising grounds being considered worthy of being called hills. The principal rivers are the Ouse, the Yare, with its affluents the Wensum and the Waveney, and the Bure. Communication is kept up by the navigable rivers, and by the Great Eastern railway. The climate is affected in spring particularly by cold n.e. winds, but the air is in general dry and healthy. The soil consists chiefly of light sands and loams, and comprises a great extent of land, which though naturally not fertile, has been made so by judicious management. The agriculture of the county is in an advanced condition, and all the usual crops are extensively grown; while that of barley is especially celebrated. Half the acreage is devoted to rearing food for cattle, and thus the necessary supply of manure is secured. Geese and turkeys are extensively reared for the London market. The county is divided into three parts, n., s., and w. Norfolk, each returning two members to the house of commons. The capital is Norwich.

NORFOLK, a city and port of entry of Virginia, 88 m. s.e. of Richmond, and 32 m. from the ocean. The city is irregularly built on low ground, and contains a city hall, military academy, mechanics' hall, court-house, jail, custom-house, 9 banks, 26 churches. Its large deep harbor is defended by fort Calhoun and fortress Monroe, the largest fortress in America. A government navy-yard, dry dock, and marine hospital are in the suburb of Gosport. Norfolk was built in 1736; in 1776 it was burned by order of lord Dunmore, the British colonial governor. In 1855 a large number of the inhabitants died of yellow fever. In 1874 the exports of Norfolk (including Portsmouth) amounted in value to $3,906,318; and, in the same year, the number of vessels belonging to these ports was 376. The pop. in 1870 was 19,229.

NORFOLK (*ante*), the co. seat of Norfolk co., Va., on the Atlantic, Mississippi and Ohio, and the Seaboard and Roanoke railroads, and the Dismal Swamp and the Albemarle and Chesapeake canals; pop. '80, 21,966. It is connected by steamer with New York, Boston, Philadelphia, and Richmond; is the second city in Virginia, has the largest foreign trade of any place in Virginia, and with Portsmouth, on the other side of the river, is the chief U. S. naval station.

NORFOLK, DUKE OF. See HOWARD, THOMAS, *ante*.

NORFOLK ISLAND lies in the Pacific ocean, 1100 m. e.n.e. of Sydney in Australia, in lat. 29° 10′ s., and long. 167° 58′ east. Length, 5 m.; breadth, 2½ m.; area, 8,960 acres. It is the largest of a smaller cluster of islands, comprising Norfolk, Nepean, and Philip islands, together with several rocky islets. The coasts are high and steep, and the surface generally uneven, rising in Mount Pitt to upwards of 1000 ft. in height. The soil is fertile and well watered, and the climate healthy. In 1825 Norfolk island was made a penal settlement by the British government for the worst class of convicts sent out to New South Wales; but the experiment was a failure, and the establishment was broken up in

1855. In 1856 the inhabitants of Pitcairn island (q.v.)—194 in number, descendants of the mutineers of the *Bounty*—were transferred hither by the British government. In 1871 the pop. was 481, the Pitcairn community numbering 297.

NO'RIC ALPS. See ALPS.

NORICUM, a province of the Roman empire, corresponding to Bavaria and other parts of the Austro-Hungarian empire; bounded n. by the Danube, e. and s. by Pannonia; also s. by Illyricum and cisalpine Gaul; w. by Vindelicia. The region is mountainous, the Noric Alps stretching through the center of the province; the chief rivers were Œnus (modern Inn), Dravas (Drave), and Murius (Mur). The chief town was Noreia, mentioned by Cæsar in his commentaries. The province was subdued by the generals of Augustus about 13 B.C. The Romans obtained iron and salt from the region, and, it is said, gold.

NO'RIUM is the name assigned by Svanberg to a metal, whose earth (or oxide) is associated with zirconia in certain varieties of the mineral zircon. Its existence is not as yet definitely established.

NORMAL SCHOOLS, institutions where teachers are instructed in the principles of their profession and trained in the practice of it. The name of normal school is of French origin (*École Normale*, from Lat. *norma*, a rule or model), and is that generally used in Scotland; such institutions, in England, are oftener called, "training colleges;" and in Germany "seminaries." That in acquiring knowledge the mind follows certain processes, and that any one imparting knowledge should do so in harmony with these processes, are truths which seem sufficiently obvious. It is only recently, however, that they have secured much attention; and they are even at this day deliberately denied by some men of thought, and of the highest educational position. The recognition of these truths has, however, been sufficiently extensive to secure the institution, in Great Britain, America, France, Germany, and Switzerland, of schools in which the principles of teaching form the subject of study, and in which model specimens of the art are given. Italy, and even Russia, are following in the wake of the countries named. These schools also afford a thorough course of instruction in the subjects which are taught in elementary schools. The only normal school for training the higher class of teachers for colleges and academies exists in Paris.

One of the earliest, if not the earliest, normal school in Great Britain was the sessional school of Edinburgh (1830), afterwards developed into the "general assembly's normal institution." The first attempt of a similar kind in England was that of the Battersea training college, instituted by Mr., afterward sir J. P. K. Shuttleworth and Mr. Tuffnell. Sir J. P. K. Shuttleworth subsequently, acting as secretary to the committee of privy council on education, suggested measures which have resulted in the institution of about fifty colleges for the training of teachers in Great Britain in connection with the Established and Dissenting churches. These turn out hundreds of male and female teachers annually, who having, after a two years' course of training, received government certificates of merit, become teachers of elementary schools.

There has been for some years a reaction against the necessity of normal schools, and their maintenance at the public expense. But this reaction can only be temporary, and the great facts will survive, that every subject of instruction is best taught according to a certain method, and that all methods are based on the study of the human mind. This is a position which it is impossible permanently to shake. The real founders of normal schools are those men who, with more or less clearness and width of view, have brought prominently forward these principles. Such were Plato and Quintilian, in ancient times; in more recent years, the most prominent names have been Comenius, Pestalozzi, Rousseau; and, in our own country, Ascham, Milton, Locke, prof. Pillans, and Dr. Arnold.

NORMAL SCHOOLS (*ante*). The establishment of these schools in the United States is due, it is said, to a suggestion by prof. Denison Olmsted in an oration delivered in New Haven, Conn., in 1816, and to various recommendations in the official messages of De Witt Clinton while governor of New York. In 1838 a gentleman in Massachusetts, Mr. Edmund Dwight, offered $10,000 for the purpose of establishing such a school on condition that the state would appropriate an equal amount. This was accepted and the first school was established at Lexington in July, 1839. Others soon came into existence in Massachusetts and elsewhere; and now nearly every state in the union has one or more either sustained by a county, city, or the state itself. In 1878 the total number of these schools was reported to be 119, the number of instructors connected with them about 900, and the students 17,000. They usually embrace the model or pattern school together with the academical features of the ordinary school. The conditions of admission are about the same in each, and require that the candidate be not less than sixteen years of age, and that he be able to pass a satisfactory examination in reading, spelling, writing, arithmetic, and the elements of English grammar. He must also intend to teach after graduating during a certain specified time. The courses of study are principally limited to the branches required to be taught in the public schools, together with a thorough theoretical and practical preparation for the special duties of a teacher. In some of the schools, however the classics and modern languages are taught. In the accounts of the various states mention will be found of these schools individually.

NORMAN ARCHITECTURE. As its name implies, this style was originated and chiefly used by the Normans. Soon after their conquest of the north of France, they began to erect churches and cathedrals in memory of their victories. Their conquests supplied them with the means for making these large edifices. They were not contented with the small churches then common in France, but desired to erect monuments worthy of their great conquests. They accordingly expanded the dimensions, while to a great extent retaining the style of the buildings they found in France. They seem also to have borrowed some of their ideas from the Rhine. See GOTHIC ARCHITECTURE.

The leading characteristics of their style were size and massiveness. They adopted the old Latin plan (derived from the Basilica) of central and side aisles; and at the east end, they invariably placed a semicircular apse. They seized on the tower as a distinguishing feature, and developed it as their style progressed. The ornaments are simple and of great variety; but the most common and distinctive are the zigzag, billet, chevron, nail-head, etc. The windows and doors are simple, with semicircular arched heads—the former without tracery. The tympanum of the door-arch is occasionally filled with sculpture.

The nave arches are carried sometimes on single pillars, but more frequently, especially as the style advanced, on piers with shafts. The shafts are almost always recessed in nooks (or "nook shafts"). Owing to the great size of the buildings, the architects were unable at first to vault the main aisle, which, accordingly, had usually a wooden roof, the side aisles only being vaulted.

The masonry is rude; the joints being large, and the stones generally unhewn. The style prevailed from about the beginning of the 10th c., till the death of William the conqueror, near the end of the 11th century. There are many examples in Normandy, the churches at Caen being well-known buildings of the date of William.

This style of architecture was brought into England by the Normans at the conquest, 1066. They there extended the scale of the buildings, as they had done in Normandy, preserving, however, many local peculiarities of the Saxon style, which they found in the country. The chapel in the white tower of the tower of London is the earliest example of pure Norman work in England. There are, however, many buildings, both in England and Scotland, which date from before the end of the 12th c., when the pointed style began to be used. Durham, Lindisfarne, Canterbury, Dunfermline are partially Norman, besides many other churches and castles. The Anglo-Norman is heavier than the French-Norman, the cylindrical nave piers of the above buildings being much more massive than those of French works. To relieve this heaviness, the chevron, spiral, and other groovings were cut in the piers. The mouldings and forms of doors, windows, etc., are the same as those of Normandy. There is one remarkable difference in the plans of the early Norman churches in the two countries: in France, the apse at the east end is always semicircular; in England, this form was gradually given up; and towards the end of the style, the square east end was universally adopted.

NORMANBY, CONSTANTINE HENRY PHIPPS, Marquis of 1797–1863, b. England; son of the first earl Mulgrave. He was educated at Harrow and Cambridge, and returned to parliament for Scarborough in 1818. He acted with the liberals, though his family had always been tories; his first speech was in favor of the political claims of the Roman Catholics, and his second advocated lord John Russell's proposals for parliamentary reform. He left parliament, which he re-entered after a residence of two years in Italy. While in the commons, he secured the abolition of the sinecure office of joint postmaster-general, and advocated the extension of the suffrage in the great manufacturing towns. He succeeded to the title in 1831, and soon after was made governor of Jamaica, where he successfully executed the act for the emancipation of the slaves, and suppressed without loss of life a mutiny of the soldiers. Returning to England, he succeeded the earl of Carlisle as lord privy seal in 1834. He was lord-lieutenant of Ireland, 1835–39, displaying an impartiality which won the approbation of O'Connell himself He was made a marquis at the coronation of Victoria, and was colonial secretary for a short time in 1839, but was soon transferred to the home department, where he remained till 1841. From 1846 to 1852, he was ambassador to France, and from 1852 to 1858, to Tuscany. He published *A Year of Revolution*, 1857, containing his personal observations at Paris, and a number of novels, including *Matilda*, *Yes and No*, and *The Contrast*.

NORMANDY (Fr. *Normandie*), formerly a province in the north of France, bordering on the English channel; now divided into the departments of Seine-Inférieure, Eure, Orne, Calvados, and Manche. It is in general a very fertile, richly-cultivated land, resembling a garden in many districts. Its chief agricultural products are corn, flax, and fruits (from which cider is largely made); its fisheries and manufactures of great importance, and its horses the best in the kingdom. The inhabitants are for the most part descendants of the old Normans, and bear the stamp of their splendid ancestors. They are intelligent, strongly built, and of a noble and energetic character; warm-hearted and patriotic, they produce the boldest sailors, the most skillful fishermen, agriculturists, cattle-rearers, and gardeners in all France. In the north-eastern and more level part (formerly *Upper Normandy*), the principal towns are Rouen, Dieppe, Havre-de-Grace, Harfleur, Honfleur, Lisieux, Evreux, Yvetot; in the south-western and hilly part (*Lower Normandy*), the principal towns are Caen, Falaise, St-Lo, Bayeux, Coutances, Avranches, Balonne, Alençon, Cherbourg, and Mont-St-Michel.

In the time of the Romans, the country bore the name of *Gallia Lugdunensis II.* Under the Frankish monarchs it formed a part of Neustria, and was first called Normandy after Charles the simple, in 912, had given it to Rolf or Rollo, the leader of a band of Norse rovers (see NORMANS), to be held by him and his posterity as a fief of the French crown. From Rolf (baptized into Christianity under the name of Robert) and Gisela, the daughter of Charles, sprung the latter dukes of Normandy, of whom Richard I., grandson of Rolf, vigorously maintained his authority against his liege lords, Louis IV. and Lothaire. William II., son of Robert II., became duke of Normandy in 1036; and in 1066, established a Norman dynasty on the throne of England (see WILLIAM THE CONQUEROR), thereby politically uniting Normandy with the latter country. In 1077 his eldest son, Robert, wrested Normandy from him, but it was again united to England under Henry I. in 1105. With this monarch, Rolf's male line became extinct. Henry II., the son of Henry I.'s daughter, Matilda, after the death of Stephen of Blois, obtained in 1154 the government of England and Normandy; but in the reign of his son, John Lackland, it was conquered by Philippe Auguste (1203–04). It remained a portion of the French monarchy for more than 200 years; but after the battle of Agincourt (1415) it was reconquered by the English, who held it till 1449, when it was finally wrested from them by Charles VII. See Liquet's *Historie de la Normandie* (1835); Palgrave's *History of Normandy and of England* (1851–64).

NORMANDY, CUSTOMARY LAW OF (Fr. *Coutumier de Normandie*). The ancient provinces of France were governed principally by a system of laws called *Coutumes*, which had originated in local usages, and been in the course of time reduced to writing and formally sanctioned by the sovereign. *Coutume* was distinguished both from *loi*, which originated with the king, and from *us*, or usage not reduced to writing. Of the codes of customary law, one of the oldest and most famous was the *Coutumier de Normandie.* It was divided into the ancient and modern custom. The former was first reduced to a written form, in 1229 under St. Louis; the latter was the ancient *coutumier*, modified and reformed in 1585 by commissioners appointed by Henry III., with the concurrence of the three estates of the nobility, clergy, and people of Normandy. The ancient *coutumier* treats principally of the duties of the judicial officers, the proceedings in the different courts, and the rights and obligations of the kings of France, the dukes of Normandy, the feudal lords, and the people. In the modern *coutumier* are minute regulations regarding the transmission of property by will and inheritance. Each of the 22 vicomtés, into which Normandy was divided, had a different mode of devising real property. The law by which the Channel islands are still governed is based on the customary law of Normandy. The chief judge in Jersey, Guernsey, and Alderney retains the Norman name of bailli or bailiff, and his authority is much the same as that officer possessed under the Norman law. One of the most remarkable remnants of the *coutumier* still subsisting in the Channel islands is the *Clameur de Haro.* Any one who considers that his rights of property are infringed, protests in the presence of two witnesses, and calling out three times "Haro" (said to be a way of invoking duke Rollo, noted for his justice), summons the trespasser to desist. He then applies to the authorities, relating what he has done, and proceeds to the record office, where note is taken of the circumstances; all which ceremonial must be gone through before bringing an action of trespass. The decision is generally referred to *une vue de justice*, and the losing party is subjected to a fine, and liable in costs: he had formerly also to undergo *un regard de château*, or twenty-four hours' imprisonment, for having implored the aid of the prince without cause.

NORMAN-FRENCH. The well-known "oaths of Strasburg" A.D. 842, though by no means showing any pronounced dialects, are indicative of the state of the Romance languages when the Northmen first began their incursions into France. Rollo (Hrolf, whether contracted for Hárulf, Hraudulf, or Hroarulf, that is, high, red, or fierce wolf, is hard to say) received Neustria as a fief in 911. The number of his men was evidently much exaggerated by the monkish chroniclers of the time, and though the Saxons had long possessed settlements there, though there had once been a ruling Frank population, and though the Northmen must, in their usual fashion, have continued a desultory immigration for years, yet the proportion of Teutonic words (except sea-terms) is little larger than in the other Languedoil dialects, and by the third generation, except at Bayeux, only Norman French was in general use. The northern Romance, or langue d'oil, ultimately counts five dialects, Walloon, Picard, Normand, Frankés, Bourgoin. The fifth of these is the parent of modern French, yet, until the Italian campaigns of Francis I., there is, from the modern point of view, no French language. Each man writes his own patois, and it follows, from varying influences and successive dynasties, that French, the ultimate survivor, will contain a certain admixture of other dialects. It happens that many of the Normand peculiarities have appeared in modern French, and this it is which gives a certain color to those works which institute comparison between English and modern French, a process applicable to a certain number of technical and scientific words which, in truth, are neither French nor English, hardly even Latin. The rule of transformation from Latin to any neo-Latin dialect is, the accepted syllable (tonic) is preserved, unaccented syllables (toneless) are dropped or contracted; precession is applied sparingly, but later generation of secondary mutes takes place throughout. Vowels undergo changes which vary with the dialects. The only apparent exceptions to these rules are formed, not from the Latin, but from a rustic word, usually derivative, and with its accent corresponding to the French. The infliction of Norman-French upon English, little in the 12th c., becomes overbearing in the 13th. From 1220 to 1290 at least one-seventh of the Teutonic words are lost, including the power of compounding. The gaps are filled by French importations. In examining Norman-French from the stand-point of its bearing on English, it is particularly necessary to direct our attention to this century, to the spelling and form of Norman words at that time; the changes in English since are simply these: The Norman accent, already called identical with the Latin, is, in two-syllabled words, on the first, if the word is female (poetically speaking), on the second if male. The English throws back (and the process was evidently only half finished in the time of Shakespeare) this accent to the first syllable, and it is this retrocession which makes it difficult to distinguish between a modern and hybrid word from the French, and an old though wrongly accented word from the Norman. We have, besides, applied a cumbrous and arbitrary system to indicate secondary mutes, notably *g* and *j*, and have, under the influence of the pedants of the 17th c., restored many letters, dropped or contracted in passing from Latin to Norman. These are the rules of change from Latin to old French, most examples being either Normand or Frankés (Ile de France); the particular distinctions for Norman will follow:

I. Toneless Syllables after the Accent.

a. Paroxytons:—disappear—frúctus—fruict; dámnum—dam; —or change to mute e: rosa—rose; granum—graine—grain. *b.* Proparoxytons:—contract—ángulus—ang'lus—angle. Both syllables become *e* mute; dómina—dom'ne—dame; or disappear entirely; dóminus—dom—Eng. dan. (Blasphémus, in lingua Rustica blásphemus, blasme, Eng. blame. Encáustum, pronounced like Greek égkauston, enque—Eng. ink, Fr. encre.) *c.* Formative terminations, two-syllabled and toneless: *ĭcus—ĭca—ĭcum; i* drops, *c* precessed—fábrica—farge and forge; gránica—granche, grange; *áticus*, contracted first into atge—missáticus—message; *ĭcus—ĭca—icum=e* mute—públicus—pople, not publíc; scholásticus—escolastre, scollard. Termination wholly dropped: láicus—laic or lay (bárica, Fr. Gr. báris, barge, modern barque; phantásticus, fantasche, mod. fantasque). There are a few exceptions, liturgical words or technical: *īcus, i* long = *ic* or *i; īca = ic—amīcus*, amic, ami; *ĭcem—i* drops, *c* is softened or precessed—panticem, pance, paunch; *īcem—i* long = *is, isse, iche*—corníccm, corniche; *ĭdus, ĭdis, ĭda. i* drops, *d* final should be *t*—vápidus, fade; víridis, vert. Without final *d*—pállidus, palle, pale; *ĭlis, ĭlos, ĭla.* Contraction—áquila, aigle, eagle; útilis, utle, not utíle; *īlis = il*—avrílis, April; gentílis, gentil, genteel; *ŭlus, ŭla, ŭlum.* Dropping of *u*, and contraction—tabula, table, etc. Vocalization of the consonant: bájulus, bail; mácula, mail; *áculus, ículus, úculus*—trabáculum, travail, travel. Change of *l* to *r:* Reflex action of *u* in the penult; régula, ricule, rule; *ŏlus, ŏ* drops, *tl = tr* in French, but remains in English—apóstolus, apostle, Fr. apôtre; *ĭmus, ĭ* drops, final *e* mute—décimus, disme, dime; *ĭnus, ĭnem.* As before, and *u* drops—ásinus, asne, Eng. ass; *n* changes to *m*—consuetúdinem, coustume; *n* changes to *r*—cóphinus, coffre; *n* drops—imáginem, image; *ĕrem*, etc., *ŏrem, ŭra*—cucúmerem, cucumbre, Fr. concombre; *ĭtem*, etc.; *i* drops—cucúrbita, goourds, gourd. Without *e* mute: paepósitus, prevost. (Spíritus, made in Norman espri, though in Fr. esprit, which is contrary to rule. The English word is later.) *ĕus, ĭos* (a. um.). The short vowel becomes *j*, or *ch*—calúmnia, calonge, challenge. The vowel becomes liquid in Fr., but not in Eng.: fóliuum, foil, Fr. feuille. Reflex action of the vowel when dropped: ingénium, engein, engine. Vowel disappears: fácies, face, etc.

Note an exception: A low-Latin termination, *ĭa*, which, especially in Languedoc, serves as a derivative, and is applied to a bastard Latin form, itself derived from a neo-Latin word. Such are: compaing, compagnie, company; jalos, jalousie, jealousy, etc. Strengthened by *r*, it applies even to words derived from the Teutonic, viz., fladdha, old Eng. to flyte, flatter, to flatter. And from this *ie* came our true English geographical forms in *y*, Italy, Araby, etc. *Verbs in ĕre.*—When the *ĕ* drops they become verbs of the French conjugation in *re;* so they were, but after the invention of the third in *oir* they were, owing to a too close juxtaposition of consonants, changed to others. Thus, empreindre, to imprint, is in mod. Fr. émprimer. But as most Norman verbs are changed to English by the summary process of chopping off their tails, little shows of the old forms in our language. But some mistaken transformations of *ĕre* can still be discerned: morēre, muevre, to move; placēre, plaiser, to please.

II.—Toneless Syllables before the Accent.

a. Immediately before, they persist: coróna, couronne, legális, léal, loyal. Exception: thériaca, triacle, treacle. When a consonant drops, and two vowels touch, they are contracted: aetáticum, eage, age, or fused: magíster, maēstre, master; but if the syllable begins with a vowel, it is often dropped: arúnculus, oncle; but if not initial, the short vowel immediately before the tone vowel drops: bonitátem, bonté, bounty. If the vowel is long it generally persists: labōráre, labourer, labor. *b.* Unaccented syllables not immediately preceding the tone: dominicélla, dencele, donzel.

III.—Latin Vowels.

If toneless, they are treated without method in spelling; but if accented, *a* continues, sáccus, sack; even if a toneless vowel has dropped: at(i)cus, ab(i)lis = age, able, etc., grace, grátia. The vowels of the Norman, whether influenced or not by the nasality and burr of the Norsk, show a constant tendency to too great broadness and too great fineness, as compared with a standard approaching the Latin, and this standard is best furnished by modern English spelling, when that remarkable system has been left to itself. The Norman changes will be recognized on sight as characteristic of old, notably from Chaucer to Heywood, English, or of provincialisms still current, even in America. Norman *a* is Danish *á*, Gothic *au*, English *aw:* graud, sometimes spelled graunt; but when followed by gutturals or nasals, French turns *a* to *ai:* pácem, pais. This *ai* is in Norman a diphthong, often represented by *ae;* and the Irish pronunciation of English peace is of course only English of Spenser's time, and rightly descends from it; *ai* in mountain is rightly placed in French to Montaigne's time, and marks the vowel as short. Norman varies between *al* = *al*, as in poiterui, or *al* = *aul*, *l* becoming silent, which is modern French, but the *a* is always very long. Phantasma, fautôme, Eng. phantom (!), is a true Norman broad *a;* but we say tax, while the French is still taux. Most short vowels are liquified in Norman, just as in Icelandic; thus short *a* in căput, chapt, chief, and even long, grávis, graef, grief. These are, as compared with Norman or French, so few in English that it would seem a late introduction with us. *E* is in French raised in pronunciation, but in English persists: féstum, feste, feast; *el* final is often replaced by *ian*, mod. *ean;* *e* before a dental fluctuated between *ei*, pronounced as *ai* in straight, and *oi*, pronounced in Norman like *oy* in boy. This struggle continues in modern French, but there is little trace of it in English: peusum, pois, Nor. and Eng., peiz (averdupeiz is etymologically correct); heres, hoir, Nor. and Eng. heir; but monéta, monoie, old Fr. and Nor.; monnaie, mod. Fr. = Eng. money. *Ē* = *ī* in verbs of modern conjugation: poenitēre, repentir, repent; and in English varies in racémus, raisin. Exceptions: sébum, soef, suet. *Ĕ* is liquidized: relevo, reliève, relief; but not in tenerum, tendre, tender. *E* tonic is liquidized: sédia, siege, sied, seat, and equals *ī:* prétium, prix, price. *I* usually becomes *e*—crista, creste, crest; but remains before nasals—simplicem, simple, dignor, daigner, deign:—*isc* becomes *ois*—turchisca, turquois, turquoise: *ī* keeps in—ficus, fique, fig. *ĭ* becomes *oi*, = Eng. *ĕ* or *ĭ*—picem, poix, peix, pitch, plico, plier, ploier, ply: *ī* or *ĭ* in certain cases—invidia, envie, envy. *O* generally persists: costa, coste, corselet, coast, cutlet; but cognitus, cointe, quaint. Variations from *ol* to *ou*, but pronounced long: follis, fol, fool; in other positions, persōna, personu, person, becomes *eu* and *ou*, in English more open or more closed: florem, flour, flower, fleur, ferocem, farouche, feērs, fierce, domitare, domter, daunt.

In Fr. an *i* has a reflex action on *o;* not so in English. This and other indications point to the final *e* being sounded until about 1100: gloria, gloīre, glory, ostrea, oistre, oyster, puitre, solium, seuil, sill. *U* changes to *ou* in French, and in English remains *u:* crusta, crouste, crust; changes to *o* in French, in English remains: columna, colomne, column; changes to *oi*, both French and English: punctum, point; but truncus, tronc, trunk; and *oi* to *ui*, but not always in English: fructus, froict, fruit; *u* long, Latin, is sometimes long, sometimes short in English, but in Norman was always long: cupa, coupe, cup; *u* short varies: cupreum, coipre, copper; and though influenced by the reflex of an *i* in French, in English varies: angustia, angois, anguish. *Y*. The latin *y*, a Greek letter, was reproduced in Norman and in English, but is *i* in French: lyra, lyre, Fr. lire; muxa, mesche, match. *Æ*. Treated as an *e* long, and even as an *e* short: quæstum, queste, quest. *Œ*. Same treatment: pœna, poine, pine, pain. *AU*. Already interchanged in late Latin with *ō*. English, Norman, modern French, all vary in treatment: Lat. frauda, thesaurus, nausea; Nor. frode, thésore, noise; Fr. fraude, trésor; Eng. fraud, treasure, noise. *EU*. No Latin words in the Norman, but the Celtic: leuga, line, lieue, league. *UI*. Diphthong rare in Latin. The two vowels occur in circuitus, circuit.

IV.—Vowels and Diphthongs Unaccented.

The cases of anomalous change in toned vowels shown in the exceptions just stated are usually the same as those of the toneless sound corresponding. A few cases of persistence or change may be shown more at length: *A*. Remains in place: carnalis, charnal, charnel. *E*, mercédem, merci, mercy. *I*, imáginem, imaige image. *O*, obscúrus, obscur, obscure. *U*, humánus, humain, human. Where French takes *e*, English often keeps *A*, canális, chenal, canal; *E*, fenúculum, fenoil, fennel; *I*, minútus, menu, mean, fidēles, fēal, feal(ty), fiau; *O*, commendo, quemande, command; *U*, succúrere, secourre, succor. Other changes will be found in exceptions, and can be expected from the character of the Norman vowels already described. It is singular that Norsk and Norman, being unusually nasal, English, especially old, is not, misspelling by preference any open vowel followed by *m* or *n*.

V.—Hiatus and Semi-Consonants.

Hiatus is produced much more frequently in Norman than in French, final *e* being preserved before a vowel, *s* in the nominative retained, and probably, under form of *s*, *x*, *z*, pronounced. Vowels not *i* and *e* before an open vowel (they are always liquid) are separated in pronunciation. Both rules are Norse. *Ge*, *gi*, *de*, *di*, before vowels are certainly not *j* before 1200, and *zh* even later. *Ci*, *ki*, *qui*, *ce*, *ke*, *que*, before vowels are not Picardized into *ch* and *sh* till the same time. *Ts* and *ti* may have equaled *se* and *si*, but certainly not *sh*. *Hi* is of not the slightest consequence—as often absent as present. *Ch* of early Norman simply equals *k*. On the whole, English is likely to keep a Latin letter and avoid hiatus, where Norman would drop it.

VI.—Consonants.

Taken as initial, medial, or final, of course after disappearance of the Latin covering syllable. Modern French dislikes double consonants, unless one be liquid or nasal; Norman and English show such feeling in some instances: captivus, chaitif, captive; but judicare, juger, judge. Also, true of these consonants when the last drops: blasphemare, blâmer, blame. Changes of consonants are: precession, assimilation, transposition, and all are much less common in Norman, and therefore in English, than in modern French. *D* gutturals *c* and the *ch* it replaces.

Initial.

Chorus, queir, quire (= *k*); but capelletam, goubelet, goblet; calx, chaulx, chalk, (= *ch*); capulum, chable, cable; cedere, ceder, cede (= *s*); chirurgianus, siurgien, surgeon.

Medial.

Pertica, perche, perch; but laxus, lasche, lax; pacare, payer, pay—disappears; ducatus, duché, duchy, various; licére, loysir, leasure; jocus, joca, joke.

In combination

Cc, accentus, accent; *ct*, fluctuare, floter, float; placitum, plait, plea; factionem, façon, fashion; *cs* or *x*, extraneus, estrainge, strange; exilium, eissil, exile; *x*, taxa, tasche, task (= *sk*); but fixare, ficher, fix; *cm*, Jacomus, Jaimes, James, etc. *Qo* has persisted in English, though less in French; but aquila, aigle, eagle. *G*, initial and medial, or final: gobinem, gougeon, gudgeon (= *g*); but gagâtes, jayet, jet; angelus, angiel, angel (= *j*); flagellum, flael, flail, disappears.

In combination.

Gva, *gve*, languere, languir, languish; *gr*, *gl*, peregrinus, pélérin, pilgrim; but integrum, entier, entire; *ugr*, *ugl*, plaugere, plaindre, plain; *gn*, pugnare, pogner, punch; amygdala, amandle, almond. *J*, Latin, a real *g* is now in French *zh*, but English *j*: projectus, progeict, project; raja, raie, ray. *H* invariable in Norman, only in Teutonic words: hairon, heron; hair, hate. English has from it two words which do not deserve the *h*; the French is entirely arbitrary: eremita, hermit; upupa, hoopoe. *P* almost intact, but cupitare, couvoiter, covet, pulpitulum, poulpitre, pulpit; but caput, chief.

In combination.

Ps, psalmus, saulme, psalm (pedantic); *pl*, duplex, double; *pr*, aprilis, avril, april; *ps*, capsa, chasse, caisse, case; *pt*, *pd*, ruptus, raout, rout, and examples already given; *pi*, *pe*, pipionem, pichon, pigeon; *pp*, mappa, nappe, nap(ery). *B* almost always persists: but taberna, taverne, tavern; subundare, soonder, sound, etc.; *br*, brevis, brief; febris, fièbre, fever; *bl*, fabula, fable; debilis, deueil, dule; *bt*, subitanus, soudein, sudden; *bs*, absolvere, assouldre, assoil; *bi*, *bm*, *bv*, subvenire, souvenir. *F*. *ph*, which was always replaced by *f*, generally persists, yet bifax, viais, bias. *V*. initial low Latin *v* represents *v*, *w*, *gu*, even *qu* of the Teutonic languages, and most of these words in English in which *g* represents Norman *gu* have another form in *w*, the true one: vadium, gaige, gage = wage; guarder, guard = ward; guigue, jig = gig(gle), Danish, and the word never has come into English; elsewhere *v* persists: novellus, novel, estridge; but avisstruthio, austruche, ostrich; salvus, saulf, safe. *M* persists, but comestabulus, connestable, constable; stramen, estrain, strain; *mr*, *ml*, camera, chambre, chamber; marmor, marbre, marble; *mu*, adluminare, alluminer, allume; *mt*, *md*, *mc*, *mi*, *mg*, in all *m* changes to *u*: comitem, counte, count; cambiare, changier, change; *mb*, *mp*, gamba, geambe, gam(mon). *T*, *th*, which is replaced by *t*, disappears: potere, pooir, power; but many old words keep *t* between two vowels: materies, matière, matter. And the Languedoc words: metallea, médaille, medal; intybum, endive, change t to d; bombitare, boundir, bound; *st*, culcitinum, coulsin, cusheon; *tc*, silvaticus, saulvage, savage; *tm*, *tn*, platanus, plane, plane; *tr*, latrocinium, lareçin, larcen(y); *tl*, voltulare, vaultrer, vault. *T* final, saved though mute in many French words, is even more preserved in Norman, always when originally preceded by a consonant. In past participles it keeps *ct*, and the old *t* final, which is now *ct*. *T* before toneless *i* or *e* and a vowel is always soft in French, but Norman had preserved the spelling, though hardly the pronunciation: potionem, poison. *D* initial persists; medial is lost: predicare, preecher, preach; *d* between two vowels is almost never Norman, yet estude, rude, odeur; *d* final, drops: gradus, grée, degree; *d* and another consonant, *d* drops, but not always in English. *D* intrudes in tenerum, tendre, tender; *ds* assimilates: adsecurare, assurer, assure. *S* almost unchangeable: but sicera, cidre, cider; designare, desseiner, design. In combination *s* usually drops, but not as much as in modern French: *sc*, vascellum, vaissel, vessel; *sp*, despectus, despeit, despite; *sn*, asinus, asne, asse; *sl*, vassaletus, vaslet, valet (Danish.) *Sr* or *or*, insert *t*, antecessor, ancestre, ancestor. *Dis*, *ex*, in French *dé* and *é* are preserved in Norman, as well as *st*; in modern French *e*, with *sp* initial, makes *é*. English makes *sc*, *sp*, *st*, initial; late Norman makes *esc* or *esch*, *esp* and *est;* the inference is evident.

Latin.	English.	Late Norman.	French.
scala,	scale,	eschiel,	échelle.
sparsus,	spare,	espars,	épars.
strictus,	straight,	estreict,	étroit.

Not all of these words are technical, and borrowed by Saxon before 1000 A.D., and though it is an exception to Romance rule, it seems likely that Norman was more like English than French in this up to 1150. Other changes are: staunum, estein, tain, tin; stationem, saison, season. *Z* Latin, in verbal terminations, should always be *s*: baptizare, baptiser, baptize. Before mentioned: zelosus, jaloux, jealous. *N*, initial, medial, and final remains: sanus, sain, sane; but quaternum, quahier, quire; and diurnum, jour, jour(nal). Latin, udinem: consuetudinem, coustume, custum; couchylium, coquille, cockle. Other cases mentioned already. *N* before short *e* or *i*: seniorem, seignieur, seignior. *N* inserted: laterna, lantern; reddere, rendre, render; but joculari, jongler, juggle. The groups *ndr* for *nr*, and *ngl* for *gl*, are decidedly Norsk; so is *mbl* for *ml*. *L* generally rests initial, medial, or final: filius, filz, fitz; vocalis, voielle, vowel. Note, digitalis, deel; détale, ditany. *L* in combination: followed by *ly* consonant, *l* = *u* in French, but not in Norman and English: Note, marla (for marg'la), marne, marl; scandalum, scandale, scandal; esclandre, slander. *R* remains, except changing with *s* seldom, and *l* sometimes; remains in English: kaemmer-leik-ing, chamberlenc, chamberlain. Often transposes: fimbria, freinge, fringe. The proportion of Norman words in English, and the history of the connection between the two languages, may be found in so many treatises that no attempt has here been made to do more than carefully indicate the true derivation and spelling of Norman words in English. The grammar and the literature of the language belong to the study of French dialects; and as written by even the second generation after the conquest, always excepting Richard cœur de lion and a few troubadours, the English productions in the tongue are so bald and corrupt as scarcely to repay translation into the pure dialect of their time. They never had a possessive nor any serviceable particles; they forgot the two cases of the noun and the double formation of object and subject; they neglected the subjunctive of their verbs, and forged abstracts by hitching a termination to the first word they happened to remember.

NORMANS (i.e., Northmen). a name generally limited in its application to those sea rovers who established themselves in that part of France called after them, Normandy; but sometimes embracing also the early inhabitants of Norway. During the middle ages, the name Northmen, or Norsemen, was often used in a broader sense, to denote the entire population of Scandinavia, and still more frequently, perhaps, to designate the Danes and Norwegians, exclusive of the Swedes, The Germans and French called the piratical hordes who ravaged their shores Normans or Northmen; the Saxons, usually Danes or Eastmen. They were also distinguished by the latter as *Mark-* or March-men (from Den-*mark*), as *Ash*-men (i. e. men of the *ashen*-ships), and as the *Heathen*. The primary cause of the plundering expeditions southward and westward across the seas, undertaken by the Norse Vikings (*Vikingar*, meaning dwellers on the *vics*, i. e., bays or fiords). as they called themselves, under leaders, who took the name of "Sea-Kings," was doubtless the over-population and consequent scarcity of food in their native homes; besides, the relish for a life of warlike adventure, conjoined with the hope of rich booty, strongly attracted them; while—at least as long as the old Scandinavian religion lasted (i.e., till about the end of the 11th c.)—death in battle was not a thing to be dreaded, for the slain hero passed into a region of eternal strife in the Walhalla of Odin. Finally, discontent with the ever-increasing power of the greater chiefs or kings, induced many of the nobles with their followers to seek new homes.

The first Danish Norsemen made their appearance on the eastern and southern coasts of England in 787. After 832, their invasions were repeated almost every year. To one of these belongs the *legend* of Ragnar Lodbrok (i.e., Ragnar of the "Shaggy Brogues"), who is said to have been taken prisoner by Ella, king of Northumbria, and thrown into a dungeon filled with vipers, where, while expiring amid horrible torments, he sung with heroic exultation the story of his life. The very existence, however, of such a person as Ragnar Lodbrok is questioned by many Scandinavian scholars. In 851, the Norsemen wintered for the first time in the island. and after 866 obtained firm footing there. The Anglo-Saxon Ethelred I. fell in battle against them in 871. His brother Alfred, known as Alfred the Great (q.v.), after a long and doubtful struggle, partially reduced them to subjection; nevertheless, he was compelled to leave them in possession of Northumbria and East Anglia; and had not only to defend himself against a new and fierce invasion led by the famous rover Hastings (q.v.), but like his immediate successors, to contend against the revolts of his Dano-Norman subjects. A period of external peace now ensued; but in 991 the invasions of the Danes and Norwegians began anew. The Saxon king. Ethelred II., at first sought to buy them off by paying a sort of tribute-money, called *Danegelt* (q.v.); but the massacre of the Danes living in England, by command of that monarch, Nov. 13, 1002, was avenged by four expeditions under the Danish king, Swen, who frightfully wasted the country, and finally conquered it in 1013, dying the following year. His son Knut, or Canute (q.v.), after carrying on a struggle for the supreme power with Ethelred and his successor Edmund Ironside (q.v.), at length, on the death of the latter, became sole monarch of England, which now remained under Danish or Norse rulers till 1042. The government of the country then reverted into the Saxon hands of Edward the Confessor (q.v.), who was succeeded in 1066 by Harold II. (q.v.), son of the powerful Goodwin, earl of Wessex (q.v.); but in October of the same year, Harold lost his life and crown at the battle of Hastings, and William the Conqueror, a descendant of a Norwegian chief who had settled in Normandy, once more established a Norse dynasty on the throne of England, but one greatly refined and improved by long residence in a comparatively civilized region.

It was also Danish Norseman, in particular, who ravaged the western coasts of European mainland, from the Elbe to the Garonne. As early as 810, the Danish king, Gottfried, had overrun Friesland; but the power of the great Charlemagne was too much for these undisciplined barbarians, and they were overawed and subdued for a time. Soon after his death, however, they recommenced (*circa* 820) their piratical expeditions, and favored by the weaknesses and dissensions of the Carlovingian rulers, became, during the 9th c., the terror and scourge of north-western Germany and France. They plundered Hamburg several times, ravaged the coasts of the Frisians (which then extended as far as the Scheldt), and in 843 firmly planted themselves at the mouth of the Loire. But ere long they ceased to be satisfied with making descents and settlements on the coasts, and in their small piratical craft they swarmed up the great rivers into the interior of the country, which they devastated far and wide. Thus in 845, they ascended the Seine and plundered Paris—an exploit which was frequently repeated. In 885, not less than 40,000 of these Vikings are said to have ascended the river from Rouen, under the leadership of one Siegfried in 700 vessels, and besieged the capital for ten months. It was only saved at the expense of Burgundy, which was abandoned to their ravages. In 881, Louis or Ludwig III., king of the West Franks, inflicted a severe defeat on the invaders at Vineu, near Abbeville in Picardy, the memory of which has been preserved in a song still popular among the country people; but neither that, nor the repulse which they sustained from the brave German monarch Arnulf, near Louvain in 891, could hinder them from making fresh irruptions. In 892, they appeared before Bonn, and tradition says that bands of Danish rovers penetrated even into Switzerland, and established themselves in the canton of Schweiz and the vale of Hasli. From their settlements in Aquitania they proceeded at an early period to Spain, plundered the coasts of Galicia in 844, and subsequently landed in Andalusia, but were defeated near Seville by the Moorish prince Abd-ur-Rahman. During 859–60, they forced their way into the Mediterranean, wasted the shores of Spain, Africa, and the Balearic Isles, penetrated up the Rhone as far as Valence; then turning their piratical prows in the direction of Italy, entered the Tyrrhene sea, burned Pisa and Lucca, and actually touched the distant isles of Greece before their passion for destruction was satiated, or before they dreamed of returning west.

Doubtless Norwegian rovers also took part in these so-called Danish expeditions. We know that as early as the beginning of the 9th c. they made voyages to the n. of Ireland, Scotland, the Hebrides, the Orkney and Shetland isles; and the increasing power of Harald Haarfager in the 9th and 10th centuries, exciting great discontent among the smaller chiefs, great emigrations took place, and these islands became the new homes of these Norwegian Vikings. About the same period, colonies were settled in the Faröe Isles and Iceland, from which some Vikings proceeded westward across the North Atlantic to Greenland in 982, and thence in 1002, south to a region which they called *Vinland*, now universally believed to be the coast of New England, thus anticipating the discovery of America by Columbus by nearly 500 years. From Norway also issued the last and most important expedition against the coast of France. It was led by Rolf or Rollo, who had been banished by Harald Haarfager on account of his piracies. Rolf forced Charles the simple to grant him possession of all the land in the valley of the Seine, from the Epte and Eure to the sea. By the time of Charles the bald the invaders had firmly planted themselves in the country, which then went by the name of Normandy (q.v.). They and their descendants are strictly speaking, the Normans of history—warlike, vigorous, and a most brilliant race. They rapidly adopted the more civilized form of life that prevailed in the Frankish kingdom—its religion, language, and manners, but inspired everything they borrowed with their own splendid vitality. At a later period (the 12th c.), they even developed a great school of narrative poetry, whose cultivators, the *Trouveurs*, or *Trouvères*, rivaled in celebrity the lyrical troubadours of southern France. Their conquest of England, in 1066, gave that country an energetic race of kings and nobles, on the whole well fit to rule a brave, sturdy, but somewhat torpid people like the Anglo-Saxons. But though the Normans had acquired comparatively settled habits in France, the old passion for adventure was still strong in their blood; and in the course of the 11th c., many nobles with their followers betook themselves to southern Italy, where the strifes of the native princes, Greeks and Arabs, opened up a fine prospect for ambitious designs. In 1059, Robert Guiscard, one of the ten sons of the Norman count, Tancred de Hauteville, all of whom had gone thither, was recognized by pope Nicholas II. as duke of Apulia and Calabria, and in 1071 as lord of all lower Italy. His brother and liegeman, Roger, conquered Sicily, 1060–89. Roger II. of Sicily united the two dominions in 1127; but in the person of his grandson, William II., the Norman dynasty became extinct, and the kingdom passed into the hands of the Hohenstauffen family.

The Swedish Norsemen directed their expeditions chiefly against the eastern coasts of the Baltic—Courland, Esthonia, and Finnland, where they made their appearance in the 9th c.—the very time when their Danish and Norwegian brethren were roving over the North sea, the English channel, the bay of Biscay, and were establishing themselves on the shores of England and France. According to the narrative of the Russian annalist, Nestor, they appear to have penetrated into the interior as far as Novgorod, whence they were quickly banished by the native Slavic and Finnish inhabitants, but were as quickly solicited to return and assume the reins of government. Hither, consequently, in 862, accompanied by other noted warriors, came three Swedish chiefs, Rurik, Sineus, and Truwor, sons of the same father, and belonging to the tribe of *Ros* (whence *Russ* and *Russians*). Rurik founded one kingdom at Novgorod, which stretched northward as far as the White sea. His successor, Oleg, united with that a second established by other Swedish adventurers at Kiev, which town now became the capital of the wide-extended Russo-Swedish kingdom. See RUSSIA. For a long period these Norsemen, who, it appears, became completely identified with their Slavic-speaking subjects in the 10th c., were dangerous enemies of the Byzantine empire, whose coasts they reached by way of the Black sea, and whose capital, Constantinople, they frequently menaced, as, for instance, in 941, when Igor is said to have appeared before the city with upwards of 1000 ships or boats. Earlier in the same century, these Swedo-Russian warriors had found their way into the Caspian sea, and actually penetrated to the coasts of Tartary and Persia. Partly from them, and partly from native Scandinavians, came those soldiers who from the 9th to the 12th c. formed the body-guard of the Byzantine emperors.—See Deppings's *Histoire des Expéditions Maritimes des Normands et de leur Etablissement en France au* 10^{me} *Siècle* (2 vols. 2d edit. 1843); Wheaton's *History of the Northmen from the Earliest Times to the Conquest of England* (1831); Worsaae's *Minder om de Danske og Normändene i England, Skotland, og Irland* (1851); Freeman's *History of the Norman Conquest* (1867–76).

NORNÆ, the *Parcæ* of the northern mythology. They were three young women, by name Urd, Verdandi, and Skuld—i.e., past, present, and future. They sit by the Urdar-well under the world-tree Yggdrasil, and there determine the fate both of gods and men. Every day they draw water from the spring, and with it and the clay that lies around the wells, sprinkle the ash-tree Yggdrasil, that its branches may not rot and wither away. Besides these three great norns, there are also many inferior ones, both good and bad; for, says the prose Edda, when a man is born there is a norn to determine his fate; and the same authority tells us that the unequal destinies of men in the world are attributable to the different dispositions of the norns. These lesser norns corresponded to the *genii* of classic mythology. Women who possessed the power of prediction or magic also bore this name.

NORRBOTTEN, the extreme n. province of Sweden, adjoining Russia and the gulf of Bothnia, separated from Lapland by the Torneo and Muonio rivers, drained by the Lulea, Pitea, and Kalix rivers; 36,797 sq.m.; pop. 86,655. It contains many lakes and rivers. The summers are hot, but the climate not unhealthy. The principal articles of export are ore and timber. Capital, Pitea.

NORRISTOWN, a borough of Pennsylvania, on the n. bank of the river Schuylkill, 16 m. n.w. of Philadelphia, containing cotton and woolen factories, iron rolling-mills and foundries, machine-shops, court-house, jail, public library, bank, 18 churches, seminary, 5 public schools, 1 German and 7 English newspapers, and in 1870, 10,753 inhabitants.

NORRISTOWN (*ante*), co. seat of Montgomery co., Penn., on the Philadelphia, Germantown, and Norristown, and Stony Creek railroads; pop. '80, 13,064. It is on high land, and regularly laid out. The principal materials used in its buildings are the marble and stone which are quarried in the neighborhood. It has a fine marble court-house, a jail, a lunatic asylum, a number of churches, a music hall, a public library, 3 banks, 2 large boarding schools, and 7 periodicals, of which, 2 are dailies, and 1 is printed in German. There are machine works, blast furnaces, rolling, cotton, and woolen mills, oil refineries, etc. Two bridges, about 800 ft. long, span the Schuylkill to Bridgeport, the e. terminus of the Chester Valley railroad.

NORRKÖPING, the first manufacturing t. of Sweden after Stockholm, is the chief t. of Linköping-Län, in east Gottland, and is situated at the junction of the Motala with the gulf of Bravike, in 58° 30′ n. lat., and 16° 15′ e. longitude. Pop. in '74, 26,365. It is a fine, well-built town, with broad streets, large squares, and numerous churches and charitable institutions. The rapid river Motala, which is spanned by several substantial bridges and lined with commodious wharfs, affords very considerable water-power, by which numerous systems of machinery are worked. The manufactures are cloths, stockings, starch, tobacco, soap, etc., while in the neighborhood are the extensive ironworks and cannon foundries of Finspång. Norrköping is a good salmon station, and is the principal Swedish port for the importation of wines and foreign spirits.

NORSEMEN, or NORTHMEN. SEE NORMAN, *ante.*

NORSE MYTHOLOGY. See ÆSIR.

NORTH, CHRISTOPHER (*pseud.*). See WILSON, JOHN, *ante.*

NORTH, EDWARD, L.H.D., b. Conn., 1820; educated at Hamilton college, and since his graduation in 1841 has been one of the most active members of the faculty. In 1843 he was made professor of ancient languages, and since 1863 has occupied the Greek professorship. For 80 years prof. North has been chairman of the Hamilton alumni association, and has edited the triennial catalogue and also a biographical catalogue. He has contributed articles to the *North American Review* and several educational journals, and has delivered lectures on literary topics. The degree of L.H.D. (doctor of literature) was conferred upon him in 1862 by the university of the state of New York.

NORTH, FRANCIS, Lord Guilford, 1637–85; second son of sir Dudley North, the fourth baron of the line; educated at St. John's college, Cambridge, and after 2 years study there became a member of the middle temple. He was called to the bar in 1661. He had always been a student of great application, and upon entering into practice he used every means (not always dignified or honorable), to advance himself and obtain the favor of the great. He was made solicitor-general in 1671, attorney-general in 1673, lord chief-justice of the common pleas in 1675, and in 1682 was made lord-keeper of the great seal. The memoirs of the lord-keeper by his brother, Roger North, represent him as selfish, cowardly, trimming in politics, and capable of descending to baseness to increase his own power. He was a strong upholder of the prerogative, and only at the last moment warned James II., of the ruin to which that monarch's infatuation was hastening him. As a lawyer, his ability and learning were undoubted, and his decisions did much to increase the extent of the jurisdiction of the courts of common pleas. Lord Campbell characterizes his professional qualities by saying, "He had as much law as he could contain, but he was incapable of taking an enlarged and commanding view of any subject."

NORTH, FREDERIC, Lord, English minister, was b. April 13, 1732, and educated at Eton, and Trinity college, Oxford. His father, baron Guilford, a descendant of Roger, baron North (*temp.* Henry VIII.), was created an earl in 1752. North entered the house of commons at an early age, was made a lord of the Treasury in 1763, and inherited the tory politics which, in the days of Charles II., had placed his ancestor in the highest ranks of the law and the state. It was his boast in the house of commons, that "since he had had a seat there he had voted against all popular, and in favor of all unpopular measures." On the death of Charles Townshend, in 1769, he was made chancellor of the exchequer and leader of the house of commons, a post for which he was well qualified by his eloquence, good humor, wit, and readiness of resource. His folly was, however, one of the immediate causes of the American war. Earl Russell, in his *Life and Times of C. J. Fox*, says that "for £100,000 a year of revenue George Grenville provoked America, and that for £16,000 a year of revenue lord North lost America." In 1770, he succeeded the duke of Grafton as prime-minister. As a minister he was too ready to surrender his own judgment to that of George III., who, with a narrower understanding, had a stronger will, and was determined to subdue America. North was called by Horace Walpole the ostensible minister; the real minister was the king. North had to encounter an ardent and powerful opposition, led by C. J. Fox and supported by Burke. It has since been proved that North "so early as 1776 was of opinion that the system he was pursuing would end in ruin to the king and to the country." In 1778, he renounced the right of taxing the colonies. In 1782, it being impossible to carry on the war with America any longer, North resigned. "A more amiable man never lived," says earl Russell; "a worse minister never since the revolution governed this country." With North's retirement came to an end George III.'s scheme of governing the country by his own will, and ruling the house of commons by court favor and thinly disguised corruption. North was succeeded by the marquis of Rockingham, on whose death lord Shelburne became premier. Fox's dislike of the terms of peace with America led him to enter into a coalition with North, whom he had for so many years inveighed against as a minister without foresight, treacherous, vacillating, and incapable. North and Fox took office under the duke of Portland in 1783, but the coalition destroyed Fox's popularity, and the Portland administration only lasted a few months. North was afflicted by blindness during the last five years of his life. He succeeded to the earldom of Guilford, in 1790, on the death of his father, and died in Aug. 1792.

NORTH, SIMEON, D.D. LL.D., b. Conn., 1802; after graduating at Yale college in 1825, was for 2 years a tutor in that institution. In 1829 he was appointed professor of ancient languages in Hamilton college, New York, and in 1839 was elected president of the college. He has printed several orations and sermons.

NORTH, WILLIAM, 1755–1836; b. at Fort Frederick, Maine, and in 1775 entered the revolutionary army; rose from the ranks, and in 1778 was a capt. and present at the battle of Monmouth. The next year he was appointed aid to baron Steuben, and remained with him until the surrender of Cornwallis. At the death of Steuben half of his estate was left to gen. North, as he was then by brevet. He continued to serve in the army as inspector and adjt.gen. until 1800; was afterward a prominent federalist, speaker of the N. Y. legislature, and U. S. senator.

NORTH ADAMS, a village in Berkeshire co., Mass., on the Hoosac river; about 35 m. e. of Albany, 20 m. n.e. of Pittsfield; on the Troy and Boston, and the Pittsfield and North Adams railroads; pop. '80, 10,192. There are 2 weekly papers, 3 banks, and 7 churches. There are more than 15 cotton and woolen mills in the township of Adams, and very large manufactories making boots and shoes. The various mills have given the village great prosperity. North Adams is near the entrance of the great Hoosac tunnel about 5 m. in length. The scenery around the town is very fine, Greylock, distant but a few m., being the highest mountain in the state, 3,600 ft. The experiment of employing Chinese in some of the village factories attracted much attention some years ago.

NORTHALLERTON, capital of the North Riding of Yorkshire, a market-t. and parliamentary borough, 250 m. n.n.w. of London, and 30 m. n.n.w. of York by railway. It stands near the left bank of the Wiske. It contains a large number of public schools and other institutions. Manufactures of linen and leather, brick-making, and malting are carried on on a limited scale. Pop. (1871) of parliamentary borough, 4,961, who send a member to the house of commons. The battle of the "Standard," so called from a hugh standard erected on a car by the English, was fought here, Aug. 22, 1138, between the English under the earls of Albemarle and Ferrers, and the Scotch under king David. The latter were defeated, and forced to retreat with great loss.

NORTH AMERICA. See AMERICA, *ante*.

NORTHAMPTON, a co. in n.e. North Carolina, adjoining Virginia, drained by the Roanoke and Meherrin rivers; on the Seaboard and Roanoke, and the Petersburg railroads; 500 sq.m. pop. '80, 20,032. The surface is generally level and the soil fertile. The principal productions are Indian corn, wheat, oats, tobacco, cotton, potatoes, and sweet potatoes. Co. seat, Jackson.

NORTHAMPTON, a co. in e. Pennsylvania, adjoining New Jersey; bounded on the e. by Delaware river, on the s.w. by the Lehigh river; crossed in the s. by the Lehigh river, on the Lehigh and Susquehanna, Lehigh Valley, and North Pennsylvania railroads; 400 sq.m.; pop. '80, 70,316—64,021 of American birth. The Kittatinny or Blue mountains run along the n.w., and the South mountain along the south-east. The surface in the center is level, and the soil fertile. The principal products are Indian corn, wheat, rye, buckwheat, hay, potatoes, and wool. There are slate and limestone quarries, and iron and zinc mines. Sandstone is abundant in South mountain. Among the articles manufactured are bricks, lime, carriages, cigars, castings, leather, flour, lumber, furniture, pig iron, and castings. Co. seat, Easton.

NORTHAMPTON, a co. in s.e. Virginia, between the Atlantic ocean and Chesapeake bay, forming the s. part of a narrow peninsula, the extremity of which is cape Charles; 320 sq.m.; pop. '80, 9,152—9,148 of American birth—5,263 colored. The surface is level, and heavily wooded in parts. The soil is sandy, and the principal productions are Indian corn, oats, potatoes, and sweet potatoes. Co. seat, Eastville.

NORTHAMPTON, a village of Massachusetts, 1 m. w. of the Connecticut river, 95 m. w. of Boston, on the Connecticut river railway. It is celebrated for its beautiful scenery, mounts Tom and Holyoke rising from a picturesque valley. It contains many elegant residences, the county buildings, 6 banks, several academies, 11 churches, 1 cotton factory, 2 silk factories, 3 paper-mills. A bridge 1080 ft. long connects it with Hadley. Pop. '70, 10,160.

NORTHAMPTON (*ante*), a t., the co. seat of Hampshire co., Mass., on the Connecticut river, 17 m. n. of Springfield; situated on the New Haven and Northampton, and Connecticut river railroads; pop. '80, 12,172. The town is mostly on rising ground about a m. from the river, is laid out with great taste, well supplied with elms and other old trees, and has long been considered one of the most beautiful places in the country. Water power is furnished by a stream flowing through the town, and there are many mills, the chief manufactures being silk, cotton, and woolen goods, sewing silk, paper, buttons, and cutlery. The public buildings are the county court-house, town-hall, Memorial hall, built in memory of Northampton soldiers who died in the war against rebellion, and public library; there are 6 banks, a high school, many district schools, and 8 churches. Here also are the Smith college for women, the Clarke deaf mute institute and the state lunatic asylum; besides privately endowed institutions for charities and aid. There are several hotels, one at Round hill on a hill near the village, was formerly famous as a water cure institution. There are many pleasant drives in the neighborhood, the whole region of the upper Connecticut valley being noted for its picturesque scenery. The main village is connected by horse cars with Florence, which is included in the township and where are extensive sewing machine factories and silk mills.

NORTHAMPTON, capital of the co. of the same name, a market-t., and parliamentary and municipal borough, on a rising ground on the left bank of the Nen, 67 m. n w. of London by railway. In the center of the town is a spacious market-square. The principal edifices are the shire hall, the new and handsome town-hall, the corn exchange, the numerous churches, several of which are unusually interesting, as St. Peter's, a recently restored and beautiful specimen of enriched Norman, and St. Sepulchre's, much improved in 1865, one of the very few round churches in the empire, and referred to the 12th century. The hospitals of St. John and St. Thomas were religious houses prior to the reformation. Boot and shoe making, which affords employment to about 3,000 persons, is the principal branch of trade carried on here. Leather is made, and hosiery and lace are manufactured. Iron and brass foundries are in operation, and brewing is carried on. Two markets are held here weekly, a general one on Wednesday, and one for cattle on Saturday. Pop. (1871) of parliamentary borough, 44,871, who return two members to parliament.

Northampton, a very ancient town, was held by the Danes at the beginning of the 10th c., and was burned by them in 1010. After the conquest, it was bestowed on Simon de St. Liz. Its castle was besieged by the barons in 1215, during the cival wars of king John. It was the scene of a great battle fought (July 10, 1460) during the wars of the Roses, between the rival houses, in which the earls of March and Warwick defeated the Lancastrians.

NORTHAMPTONSHIRE, a central co. of England, bounded on the w. by the counties of Warwick, Leicester, and Rutland, and on the s.w. by Oxfordshire. Area, 629,912 acres; pop. '71, 243,891. Its surface is marked by gently undulating hills, alternating with well-watered vales. The chief rivers are the Nen and the Welland, both of which flow n.e., and fall into the estuary of the Wash. The county is traversed by the London and North-Western, the Great Northern, the Eastern Counties, and other lines of railway, and communication by water is maintained by the Union, Grand Junction, and other canals, as well as by the rivers. The climate of the county is mild and healthy; the soil, a black mold in the fen districts in the n.e., and brown loam on the uplands, is very productive. White and green crops are abundantly produced, and on the rich pastures cattle are extensively reared for the London market. Four members are returned to the house of commons for the county.

NORTH BASS ISLAND. See PUT-IN-BAY ISLANDS.

NORTH BERWICK. See BERWICK, NORTH.

NORTHBROOK, LORD. See BARING.

NORTH CAPE. See MAGEROË.

NORTH CAROLINA (CAROLINA, NORTH, *ante*), was first explored by a party of 108 persons sent from England by sir Walter Raleigh in 1584, and the first settlement was made on Roanoke island during that year. Trouble with the Indians, however, caused the colonists eventually to return to England, and no further attempt was made to colonize the region until several years later when people from Virginia succeeded in establishing themselves on the northern border. In 1663 Charles II. made a grant of the province, which included both of the Carolinas, to eight noblemen by whom great efforts were made to induce colonization, and shortly afterwards colonies of French, German, and Swiss Protestants came over. About 1700 the province was divided into North and South Carolina, and separate governments were organized. From this time up to the revolution, North Carolina was ruled by successive governors appointed by the English king. But in Aug., 1776, the colony ratified the Declaration of Independence, and in the following December held a convention at Halifax and framed a constitution for the state, which remained the organic law until 1835. After the revolution the state enjoyed much prosperity, and its history is marked by no particularly eventful period until the breaking out of the rebellion. The popular sentiment in the state at the beginning of 1861 was apparently in favor of the union; but after the surrender of fort Sumter and the declaration of war, an extra session of the legislature was called, and an ordinance of secession passed, April 20. The state thenceforth during the next four years suffered many disasters of war. In Aug., 1861, fort Hatteras and fort Clark were seized by federal forces; Roanoke island and New Berne were next captured by Burnside's expedition; and later the region about Plymouth, Kinston, and Washington was taken and occupied by federal troops. Other important battles fought in the state during the war were at Averysborough, Bentonville, and the taking of fort Fisher. As soon as peace was declared; a provisional governor, W. W. Holden, was appointed, and on Oct. 2, 1865, a convention assembled at Raleigh declared the ordinance of secession null, abolished slavery, and repudiated the state debt created to carry on the war. An election was held soon after, and a governor, legislature, and members of congress chosen. But as the re-organized government refused to ratify the fourteenth amendment to the constitution of the United States, the state was declared to be still under military authority, and was placed under the command of gen. D. E. Sickles. Another convention, therefore, was called, and the delegates met in Raleigh in Feb., 1868, and prepared a constitution that was ratified by the people and which congress approved. Accordingly the state was restored to the union in July, 1868. The state has suffered much in many ways during the past 15 years, its peace having been seriously disturbed for a long while by organized bands of outlaws known as ku-klux klan and its political and financial affairs having been in a troubled condition.

The mineral resources embrace not only coal and iron of superior quality, but the precious metals. Of the coal deposits there are two fields, one in Stokes and Rockingham counties with an area of 30 sq.m., and another in Chatham and Moore counties with an area of 40 sq.m., of which each square mile is believed to contain 6,000,000 tons of coal of the best quality. The beds have been mined to some extent, principally at Egypt, Farmville, and Homsville. Gold has been found in 23 counties and has been mined to a considerable extent for nearly half a century. The most productive mines are the Gold Hill mines in Rowan co., which were discovered in 1842. Other regular veins have been worked in Davidson, Cabarrus, Stanley, Montgomery, and Mecklenburg counties; and irregular veins and surface gold are also found in the same counties to some extent, and in Catawba, Randolph, Union, and Franklin counties. Between 1838 and 1874 more than $10,000,000 in North Carolina gold was deposited in the U. S. mints. Silver is found in Davidson and Clay counties, but the mines have been little worked. Copper ores of various kinds exist in several parts of the state; also lead, zinc, antimony, and other metals are known to exist, with some small amounts of platinum and palladium. Mica is profitably mined in Mitchell and Yancey counties. Alum, graphite, jade, buhrstone, granite, kaolin, limestone, whetstone, grindstone, soapstone, and corundum are found, the latter in great abundance; and, in fact, the mineral wealth of the state is remarkably great. The agricultural products are chiefly rice, cotton, tobacco, sweet potatoes, wheat, and Indian corn; but the soil, as well as the climate, differs much in different parts of the state. The temperature of the lowlands is hot and humid; but in the interior, particularly in the Piedmont and the mountain section, the air is singularly pure, dry, and elastic. The mean annual temperature at Raleigh is 60°; at Asheville, 50°; at Wilmington, 68°; and the average rainfall is about 45 inches. Along the coast region the swamp lands when drained and the river bottoms are fertile, and rice grows well. Further inland the soil improves and is well adapted to wheat, rye, barley, oats, and flax. Cotton is raised principally in the counties along the southern border. The western and mountainous portions are best adapted to grazing, and in these parts stock raising is the leading pursuit. The forest trees of the uplands are oak, hickory, ash, walnut, and lime; in the lowlands, the long-leaf pine; and in the swamps, cedar, cypress, maple, oak, and poplar. A very large extent of territory, extending from a point near the line of Virginia across the entire state, varying in width from 30 to 80 m., is covered with the long-leaved pine, which yields a large share of the world's supply of resin, oil of turpentine, raw turpentine, tar and pitch. In 1870 the state contained 5,258.742 acres of improved land, 12,026,894 acres of wood land, and 2,549,774 acres of other unimproved land. The total number of farms was 93,565, the average size of which was 212 acres. Their cash value was estimated to be $78,211,083, and that of their products, including betterments and additions to stock, about $57,845,940. Among the productions of that year were: spring wheat, 405,238 bushels; winter wheat, 2,454,641; rye, 352,006; Indian corn, 18,454,215; oats, 3,220,105; barley, 3,186; buckwheat, 20,109; peas and beans, 582,749; potatoes, 738,803; sweet potatoes, 3,071,840; hay, 83,540 tons; cotton, 144,935 bales; rice, 2,059,281 lbs.; tobacco, 11,150,087 lbs.; wool, 799,667; butter, 4,297,834; cheese, 75,185; flax, 59,552; honey, 1,404,040; cane sugar, 85 hogsheads; wine, 62,848 gallons; maple molasses, 418.

The leading manufacturing industries are the sawing of lumber and the production of resin, tar, pitch, turpentine oil, cotton-seed oil, tobacco, flour, and the smelting of ores. In 1870 there were 3,642 manufacturing establishments in the state, employing 18,622 hands, and using $8,140,473 in capital, raw material valued at $12,824,693, and producing goods worth $19,021,327. Of these establishments there were 147 tar and turpentine works; 227 flouring and grist mills; 104 saw-mills; 33 cotton-mills; 110 tobacco factories; 1 zinc smelting and rolling works; and 180 carriage and wagon factories. The state has four U. S. customs districts—Albemarle, Beaufort, Pamlico, and Wilmington; and it exports, coastwise and to foreign countries, large quantities of tar, turpentine, and resin, lumber, cotton, tobacco, flour, and fish. During 1870 the shipments of resin and turpentine amounted to 426,395 barrels, valued at $1,159,022; and of tar and pitch 17,660 barrels, worth $42,824. The fisheries of North Carolina are more important than any others on the southern coast, the annual catch amounting usually to 100,000 barrels. The kinds caught are chiefly the herring, shad, bluefish, mullet, and rock.

The number of railroads lying wholly or partly in the state in 1875 was 17, and the number of miles of road in operation 1488. The most important of these roads are the North Carolina railroad, 223 m. long; the western North Carolina, 250 m.; the Wilmington and Weldon, with a branch running from Tarboro to Rocky Mount, 181 m.; the Atlantic and North Carolina, 95 m.; the Raleigh and Gaston, 97 m.; and the Wilmington and Columbia, 65 m. within the state. The Dismal Swamp canal, lying in North Carolina and Virginia, affords communication between Albemarle sound and Chesapeake bay. The number of national banks in the state in 1875 was 11, having an aggregate capital of $2,200,000, and an outstanding circulation, secured by U. S. bonds, of $1,824,545. There were also 8 state banks, with an aggregate capital of $1,697,000; and 3 savings banks, loan, and trust companies, whose capital amounted to $180,000. Two fire insurance companies, one at Raleigh and the other at Warrenton, possessed assets amounting to $264,827; and there was also one life insurance company at Raleigh with a capital of $200,000, and assets amounting to $212,000.

Financially, the state has never been in a very satisfactory condition since the war. The ante-war debt in 1874 amounted to $8,878,200, but several railroad operations, together with other liabilities incurred by the state, brought up the aggregate indebtedness that year to $38,921,848, of which about $10,000,000 was for due and unpaid interest. In 1879, however, the state treasurer reported to the legislature that the total amount of the debt, principal and interest, was $27,120,227. This legislature passed an act "to compromise, commute, and settle." On bonds issued before the war (except for the North Carolina railroad) it proposed to pay 40 per cent of the principal. Other bonds were made redeemable at 25 per cent, and some even at 15 per cent of the principal. The settlement determined upon was to give, in exchange for the outstanding bonds, new thirty-year coupon bonds, dated July 1, 1880, bearing 4 per cent interest, payable annually. In 1874 the total property of the state, real and personal, was assessed at $143,723,813, which included land valued at $76,959,193; town property, $16,652,131; horses, mules, cattle, etc., $18,214,692; and farming utensils, money on hand or deposit, etc., $31,897,797. The amount raised by tax for state purposes is about $1,200,000.

A fund for the support of common schools was created by the legislature in 1825, and certain stocks, owned by the state, in banks and navigation companies, with all moneys paid into the public treasury for entries of swamp and other vacant lands, were set aside to meet this need. During the next fifteen years the fund was enlarged in various ways until, in 1840, it amounted to $2,000,000. This was destroyed, however, by the war, and the new constitution of 1868 provided that 75 per cent of the entire state and county capitation tax, together with the revenue derived from certain fines, forfeitures, and penalties, should be devoted to school purposes. At present about $300,000 is expended annually, and the public schools are kept open four months each year. A state superintendent, assisted by county commissioners and district committees, has control and supervision of the system. In 1870 the number of children in the state between the ages of 5 and 18 was 359,930, of whom 135,845 were colored. The number attending school was 65,801, of whom 11,419 were colored. In 1878, however, the report was considerably more favorable, the number of white pupils attending school during that year having been 145,155, and of colored 81,290. Substantial aid is received also from the Peabody educational fund, which maintains, during ten months of the year, from 20 to 30 graded schools, each having from 100 to 500 pupils. Besides these public school advantages the state has six colleges: the North Carolina university at Chapel Hill, chartered in 1793; North Carolina college (Lutheran), at Mt. Pleasant; Wake Forest college (Baptist), Forestville; Rutherford college (unsectarian), at Excelsior; Trinity college (Methodist), at Trinity; Davidson college (Presbyterian), at Davidson; and Shaw university (Baptist, for colored students, male and female), at Raleigh. Several of these colleges have preparatory, theological, scientific, and other special courses; and there are within the state many academies and seminaries of respectable rank, among which may be mentioned the Ellendale teachers' institute at Little River, and the Williston academy and normal school at Wilmington. Of the total number of libraries throughout the state, reported in 1870, there were 1746, containing about 541,915 volumes, of which 1090 were private. The newspapers and periodicals published amount to about 102, there being 10 daily papers, 80 weeklies, 4 monthlies, etc. The religious organizations, by the census of 1870, numbered 2,683, and possessed 2,497 edifices with 718,310 sittings, and property valued at $2,487,877. The denominations represented were: Baptist, 985; Christian, 66; Congregational, 1; Protestant Episcopal, 77; Friends, 28; Jewish, 1; Lutheran, 73; Methodist, 1193; Moravian, 10; Presbyterian, 204; German reformed, 31; Roman Catholic, 10; Universalist, 2.

The constitution of North Carolina, framed and adopted in 1868, declares that the state shall ever remain a member of the American union, and that there is no right on the part of the state to secede; that every citizen owes paramount allegiance to the constitution and government of the United States; that the state shall never assume or pay any debt incurred in aid of insurrection against the United States; and that no property qualification shall be required as a condition of voting or holding office. The executive power is vested in a governor, lieutenant-governor, secretary of state, auditor, treasurer, superintendent of public works, superintendent of instruction, and an attorney-general, all of whom are elected every four years. The legislature consists of a senate of 50 members, and a house of representatives of 120 members, who are elected every two years. The judicial power is vested in a supreme court consisting of a chief-justice and four associates, a superior court with one judge in each of the 12 judicial districts into which the state is divided, and courts of justices of the peace. The right to vote is conferred upon every male citizen 21 years of age, who shall have resided in the state 1 year and the county 30 days previous to election. Atheists are disqualified for office, and also all persons who have been convicted of treason, perjury, or other infamous crimes, and not legally restored to the rights of citizenship. Under the apportionment of 1872 the state is entitled to 8 representatives in congress, and 10 electoral votes. The electoral votes have been cast as follows: 1792, Washington and Clinton, 12; 1796, Adams and Pinckney, 12; 1800, Jefferson and Burr, 12; 1804, Jefferson and Clinton, 14; 1808, Madison, for president, 11; 1812, Madison and Gerry, 15; 1816, Monroe and Tompkins, 15; 1820, Monroe and Tompkins, 15; 1824, Jackson and Calhoun, 15; 1828, Jackson and Calhoun, 15; 1832, Jackson and Van Buren, 15; 1836, Van Buren and Johnson, 15; 1840, Harrison and Tyler, 15; 1844, Clay and Frelinghuysen, 11; 1848, Taylor and Fillmore, 11; 1852, Pierce and King, 10; 1856, Buchanan and Breckenridge, 10; 1860, Breckenridge and Lane, 10; 1868, Grant and Colfax, 9; 1872, Grant and Wilson, 10; 1876, Tilden and Hendricks, 10; 1880, Hancock and English, 10.

NORTHCOTE, Sir **Stafford Henry**, b. London, 1818; educated at Eton, and Oxford university, graduating at Balliol college in 1839 with high honors. His first position in political life was that of private secretary to Mr. Gladstone, when the latter was president of the board of trade. In 1847 he was called to the bar and was made legal secretary to the board of trade. In 1851 he succeeded to the family title and estates as eighth baronet of the line. For the next three years he was occupied in examining the state of the English civil service, and the report made by him and his colleague sir C. E. Trevelyan, led to the establishment of the present system of competitive examinations. He was member of parliament from Dudley and Stamford from 1855-66, and was then returned from North Devon, which place he has since represented in the interest of the conservative party. He was president of the board of trade (1866-67), and in 1867 was made secretary of state for India. He was appointed a member of the joint high commission which signed the treaty of Washington on May 8, 1871. On the formation of Disraeli's cabinet in 1874, sir Stafford Northcote was made chancellor of the exchequer, and when his leader was elevated to the peerage under the title of lord Beaconsfield, Northcote became himself the leader of the house. He is a magistrate and deputy-lieut. of Devonshire, a fellow of the royal society, and has received from Oxford the honorary title of D.C.L. He has published a number of political and financial pamphlets such as *Twenty Years of Financial Policy*, *Summary of the chief financial measures passed between* 1842 *and* 1861, *with a table of Budgets* (London, 1862).

NORTH-EAST AND NORTH-WEST PASSAGES. The numerous and important discoveries made by the Portuguese and Spaniards in the southern latitudes of Asia, and the reports which on their return they spread of the fabulous wealth of those regions, excited the attention of the other maritime nations of Europe, and prompted them to send out expeditions to the East Indies for the purpose of obtaining a share in the lucrative traffic of which Spain had hitherto possessed the monopoly. But the latter power, then at the height of her prosperity, was not disposed to admit other nations as sharers of her good fortune, and dealt so summarily with all intruders, having at that time the complete command of the Atlantic and Indian oceans, that her rivals were reluctantly compelled to abandon all thoughts of trading in those seas. Unwilling, however, to lay aside their designs of opening a trade with the far-famed India and Cathay (as China was then called), they resolved to attempt to reach those regions by some other route. Two plans appeared most feasible—the one to reach Eastern Asia by coasting along the north of Europe and Asia, the *north-east passage;* the other by sailing westward across the Atlantic. The latter was first attempted by John Cabot in 1497, but he found his progress barred by the American continent, or, at least, those parts of it known as Newfoundland and Labrador. Three years afterward Gaspard Cortereal and his brother made three several voyages in the same direction; and on reaching Newfoundland sailed northward, but were stopped on the coast of Labrador, in lat. 60° n. Both brothers afterward perished with all their followers. Several voyages were soon after made to discover if a passage for ships existed to the n. of America (the *north-west passage*), but without success; and the hardships which navigators were subjected to in these inhospitable climes, caused the abandonment for the time of all further investigations in that direction.

North-East Passage.—The search for a north-east passage was now vigorously prosecuted, and England had the honor of sending out the first expedition for this purpose in 1553. It consisted of three ships, commanded by sir Hugh Willoughby, and was fitted out under the direction of the celebrated Sebastian Cabot; but on rounding the North cape, one of the ships was separated from the others during a violent storm, and subsequently entered the White sea, then unknown to western Europeans. The other two, under Willoughby, drifted hither and thither, in the vast waste of water surrounding the pole, till the navigators sighted Nova Zembla. Being unable to land, they sailed back along the north of Russia, and took up their winter quarters on the coast of Russian Lapland, where they were subsequently found frozen to death. Several other expeditions were, at different times, sent out by the English and Dutch, but none of them ever succeeded in penetrating further than the e. coast of Nova Zembla, though they rendered good service to geography by making accurate surveys of Northern Europe and the adjacent islands of Spitzbergen, Nova Zembla, Waygatz, etc. It was for a long time believed that the promontory which forms the eastern boundary of the gulf of Obi was the *tabis* of Pliny, and formed the n.e. corner of Asia; and this opinion, which received the assent of the celebrated Gerard Mercator, tended greatly to encourage renewed explorations, as, according to it, the eastern coast of Asia was not more than 400 m. from Nova Zembla. The following is a list of the chief expeditions for the discovery of the north-east passage:

Willoughby and Chancelor		English,	1553
Burroughs		"	1556
Pet and Jackman		"	1580
Barentz, William (three expeditions)		Dutch,	1594–1596
Hudson, Henry	first expedition	English,	1608
	second expedition	Dutch,	1609
Wood		"	1676

In his third expedition Barentz nearly reached Icy cape, about long. 100° e. but was, with his crew, imprisoned by the ice, and died before the return of spring. Various important discoveries were made during this expedition, which proved that in favorable seasons a passage could be found to the eastward, but after the subsequent failures of Hudson and Wood, the attempt was abandoned in despair. The Russian government now took up the search, and both by overland expeditions, and by vessels starting from various points on the n. and e. coasts of Siberia, sought to discover a practicable passage. The chief of these expeditions were those of Behring in 1741, which started from Petropaulovski, and was stopped at the East cape; of Shalaroff; and of Billings. In 1875, and again in 1876, Prof. Nordenskiöld reached the eastern shores of the gulf of Obi; and in July, 1878, a well-equipped Swedish expedition, under that veteran explorer attempted once more the n.e. passage. The party successfully rounded cape Chelyu-skin, and in September were able to start from the mouths of the Lena from Behring's strait.

North-West Passage.—As was formerly mentioned, Sebastian Cabot and the brothers Cortereal were the first who attempted to double the n. coast of America; Cabot had reached as far n. as lat. 67° 30', in the strait between Greenland and America, but the courage of his crew failing, he was compelled to return. Notwithstanding his urgent representations, he was unable to prevail upon the English monarch to send out another expedition, and it was not till after several unsuccessful attempts had been made to find a n.e. passage that investigations of the n. coast of America were resumed. As these investigations were carried on till within the last few years solely by the English, their prosecution till a definite result was arrived at came to be looked upon as a point of national honor, and repeated expeditions were sent out long after it had been clearly shown that a n.w. passage, when found, would be useless in a mercantile point of view. In all, more than 200 voyages were made in search of a n.w. passage, so that only the most important of them can be even mentioned. The first expedition, after that of Cabot, was sent out in 1576, under Martin Frobisher, who made a second and third voyage in the two following years, but without any important discovery. In 1585–88 northern enterprise received an impetus from the successful expeditions of capt. John Davis. This navigator sailed up the strait which bears his name, as far at lat. 72° n., and reported open sea still further n.; he then surveyed the e. and w. sides of the strait, but without further results. Henry Hudson (q.v.), who had previously attempted the n.e. passage, followed in 1610, and discovered the Hudson strait and bay, believing the latter to be none other than an inlet of the Pacific ocean, an opinion which was proved erroneous by the investigations of Button in 1612; the latter, however, disseminated on his return the equally erroneous opinion that the bay was closed in on all sides, with the exception of the two eastern entrances. Button's account was not universally credited, and accordingly, in 1615, capt. Bylot, who had been one of Hudson's company, was sent out, accompanied by Baffin, the most skillful navigator and scientific observer of the time; but their first expedition, which was to Hudson's bay, was devoid of results. In their next voyage (1616), they sailed up Davis's strait, reaching lat. 78° n., and satisfying themselves by a very superficial investigation that their was no northern outlet, the bay (as it was then believed to be) was named in honor of its explorer Baffin's bay. On their return southwards, they coasted along the w. side, and discovered an opening to the w. which they named Lancaster sound, but believing it to be only an inlet, did not explore further. On his return, Baffin gave it as his decided opinion that no outlet to the w. existed from Baffin's bay, and the attention of explorers was again directed to discover an outlet from Hudson's bay. In 1619 the solitary attempt by foreign powers to aid in the search was undertaken by Jens Munk, a Dane, but he made no discoveries, and the attempt was not renewed. The expedition of Fox and James, in 1631, led to the partial exploration of the channel since known as the Fox channel, which forms the northern outlet to Hudson's bay, and from this time the spirit of discovery slumbered till 1741. Between this date and 1746, several expeditions were sent out to discover an outlet from the n.w. corner of Hudson's bay, but their united researches satisfactorily proved that no such outlet existed. Owing to these disappointments, the search for a n.w. passage was discontinued for more than half a century, notwithstanding the fact of the British parliament having promised a reward of £20,000 to the fortunate discoverer. In 1818 the admiralty took up the search, and sent out capt. John Ross and lieut. Parry, who sailed up Davis's strait, and ascended Lancaster sound for 30 m.; here capt. Ross gave up the search, considering it to be hopeless. But this opinion was by no means coincided in by Parry, who was accordingly sent out in the following year, and succeeded in far outstripping all his predecessors in the career of northern discovery. He entered Lancaster sound on July 30, and a few days afterward discovered a large inlet, 30 m. broad, which he named Prince Regent inlet. After exploring this inlet for some distance, he returned, and continued his course westward, as the ice allowed him, passing through a strait which he named after sir John Barrow, the promoter of the expedition. Continuing his westward course, he reached long. 110° w., in Melville sound, where he was stopped by the ice; and after wintering here, and giving names to the numerous islands, seas, and straits he had discovered, returned to Britain, with the glory of having advanced 30° of longitude further w. than any previous explorer. On his arrival he was welcomed with the utmost enthusiasm, and his discoveries imparted renewed energy to the half-dormant maritime enterprise of the British. There was now no doubt in what direction the n.w. passage was to be sought, but Parry's second expedition (1821–23) was for the purpose of determining whether the Fox channel was connected with the Arctic sea of his previous voyage; it was, however, unsuccessful. A little before this time the coast-line of North America from Behring's strait to point Turnagain, in long. 109° w., had been fully traced, so that it only remained to find some navigable passage from Regent inlet to this point, and the long-wished-for result would be attained. For this purpose capt. John Ross was sent out with an expedition in 1829, and after a laborious and difficult voyage up Prince Regent inlet, reached a point only 200 m. from point Turnagain. It was during this voyage that he discovered the magnetic pole. Dease and Simpson, in 1838, extended the survey of the American coast from point Turnagain to within 90 m. of the magnetic pole, but the hopes of a channel between these points were dashed by the discovery made by Dr. John Rae, in 1847, that Boothia (the land which bounds Regent inlet on the w.) is a peninsula of the American continent. We now come to the unfortunate expedition of sir John Franklin, which, it was fondly hoped, would settle the question of a n.w. passage. It sailed from England, May 19. 1845, and was last seen in Baffin's bay. Franklin is believed to have sailed through Lancaster sound, and ascended Wellington channel to lat. 77° n., and thence returned southwards, crossing Barrow strait, and sailing down the channel (now called Franklin channel) which separates North Somerset and Boothia Felix from Prince of Wales island to the w., where, in lat. 70° n., long 98° 30′ w,, his ships were beset with ice, Sept. 12, 1846, and Franklin died June 11, 1847. The survivors abandoned the vessels 20 m. s.w. of this point, and perished in the attempt to reach the American mainland. Many expeditions were sent out to search for the missing voyagers, and one of these expeditions, under Collinson and M'Clure, sailed from Plymouth, Jan. 20, 1850, and reached Behring's strait in August the same year. Sailing eastward the following spring, M'Clure's ship became fixed in the ice, about 60 m. w. of Barrow strait, and the crew were picked up by sir Edward Belcher, who had been sent out in April 1852 to their assistance. Belcher, who had reached Melville sound by the eastern passage through Lancaster sound and Barrow strait, returned the same way; and thus M'Clure and his company enjoyed the envied honor of being the only ship's crew who had ever penetrated from Behring's strait to Baffin's bay. To M'Clure, then, belongs the honor of having finally set at rest all doubts as to the existence of a n.w. passage. By the various English and American expeditions (1848–59) sent out to search for sir John Franklin, the whole region to the n. of the American mainland as far as lat. 77° n., and long. 106° w., has been thoroughly explored, and various channels of communication between Davis's and Behring's straits have been discovered, such as the route by Hudson's bay, Fox channel, Fury and Hecla strait and Bellot strait, into Franklin channel, and thence by either the M'Clintock or the Victoria channel, or the routes by Lancaster sound, and the M'Clintock channel, Prince Regent inlet, or Prince of Wales strait, to the open sea n. of Alaska, but all these routes are useless in a mercantile point of view. See POLAR EXPEDITIONS.

NORTHERN LIGHT-HOUSES, COMMISSIONERS OF. The body corporate which has under its mangagement the whole of the light houses of Scotland and isle of Man. The body was first constituted by act of parliament 26 Geo. III., but has been frequently since the subject of legislation. The light-houses of the isle of Man were assigned to it in 1815. By the Merchant shipping act, 1854, the commissioners are so far limited in their power, that any proposal for a new light-house must receive the approval of the Trinity house, London, and the outlay must be sanctioned by the board of trade; the cost, however, is borne by the imperial light-house fund. The commissioners act wholly in virtue of office, and give their services gratuitously. The body consists of the lord advocate, solicitor-general, lord provost and senior bailie of Edinburgh; lord provost and senior bailie of Glasgow; lord provost of Aberdeen; provosts of Inverness, Campbelton, Dundee and Greenock; the sheriffs of the following counties: Aberdeen, Argyle, Ayr, Berwick, Bute, Caithness and Sutherland, Edinburgh, Elgin, Fife, Forfar, Haddington, Inverness, Kincardine, Lanark, Orkney and Shetland, Renfrew, Ross, Wigtown, and Kirkcudbright. The business of the commissioners is conducted at an office in Edinburgh, with the assistance of a secretary and consulting engineers. In 1877 the number of light-houses under the charge of the commission was 60, beside buoys and beacons. The commissioners own a steam vessel, the *Pharos*, for supplying stores to the several light-houses, and performing annual visits of inspection. The whole system of northern lights is remarkably well organized, the merit of which is in a great measure due to the late Robert Stevenson (q.v.). A royal commission appointed some years ago to inquire into the management of the English, Irish and Scottish light-houses, has acknowledged that the "Scotch light-houses are in the best state of general efficiency, the English next, and the Irish third."

NORTHERN LIGHTS. See Aurora Borealis, *ante.*

NORTH HOLLAND CANAL. Designed by Herr Blanken, and finished in 1825. It runs from Amsterdam to the Helder, 50 m., and has a water-level width of 123½ ft., with a depth of 18½, and a bottom width of 31. It enables vessels trading from Amsterdam to avoid the island, and sand-banks of the dangerous Zuyder Zee, the passage through which once took as many weeks as it now does hours. The greatest difficulties in the way of the work were the proverbial lowness of the country, and the necessity of preventing the assaults and encroachments of the sea. The level is such that vessels are locked *down* from the sea to the canal.

NORTH RIVER. See Hudson River.

NORTHROP, Birdsey Grant, b. Conn. in 1817; took the degrees of B.A. (1841), M.A. from Yale, and studied at the Yale divinity school. He settled as pastor at Saxonville, Mass., where he remained about ten years. From 1857 to 1866 he was agent of the Massachusetts board of education, and in 1869 became secretary of the state board of education of Connecticut, a position which he still occupies. He has published a number of papers on the subject of education, and has also done much to encourage the beautifying of country towns by planting shade trees.

NORTH SEA (*Germanicum Mare;* Ger. *Nord See*), that arm of the Atlantic ocean which separates the British islands on the w. from the continent on the east. It is 700 m. in extreme length (from n. to s.), about 400 m, in greatest breadth, and has an area of not less than 140,000 sq. miles The great commercial highways from the North sea to the Atlantic are by the Pentland firth and the strait of Dover; while on the e. it communicates with the Baltic by the Skagerrack, the Cattegat, Sound, and Great and Little Belts. Along its south-eastern and southern coasts the shores are low, and are skirted by sand-banks, formed by the sand deposits carried to the sea by the waters of the Elbe, Weser, Rhine and Scheldt, which are the principal rivers that flow into the sea from the east. The shores of England, especially in the s., are also low, and here sand has also accumulated, though not nearly to the same extent as on the continental coasts. The chief British rivers that fall into the North sea are the Thames, Ouse, Humber, Tyne, Tweed, Forth, and Tay. Besides the sand-banks on the coast already referred to, there are others extending to the middle of the sea-bed, and similar in their origin to those on the coasts, and occupying altogether about three-fourths of the entire area. Of these, the principal are the bank running n.e. from the mouth of the firth of Forth for 110 m.; the one extending n.w. from the mouth of the Elbe for about the same distance; the Dogger-bank (q.v.), etc. These sand-banks, combined with the storms and fogs so common in the North sea, render its navigation unusually dangerous. Another peculiarity of the bed of this sea is, the number of extraordinary "holes" which have been found in it. Of these the most remarkable are the Little Silver Pitt off Holderness in Yorkshire, and the North-north-east Hole, 8 leagues further east. Little Silver Pitt is 25 m. in length, and from half a mile to 2 m. in width. At its edges there is a depth from 50 to 80 ft. of water, but the "hole" has a depth of 330 feet. In the n., along the Norwegian coasts, the shores are steep and rocky, and there is a depth of about 190 fathoms. The depth (31 fathoms on an average) increases from s. to north. The currents of this ocean are extremely various, and demand the greatest caution on the part of the navigator. Owing to the prevalence of s.w. winds, the currents show a general tendency towards the north-east. On the south-western coast of Ireland, the great tidal wave of the Atlantic is broken into two portions, one of which, coursing up the channel, passes through the strait of Dover; while the other, sweeping n., passes round the n. of Scotland, and then south-ward along the e. coast of Britain, and meets the southern wave off the coast of Essex. The northern portion of the tidal wave spreads over the whole of the German ocean, and though on its entrance into the North sea it is only 12 ft. in height, it rises in its progress southward, as the sea becomes narrower, in the same way as the *bore* (q.v.) is formed in a contracting estuary. In the estuary of the Humber it rises to the height of 20 feet. This sea yields immense quantities of fish, the most important kinds being cod, hake, ling, turbot, sole, mackerel and herring, also lobsters. The fisheries employ many thousand people. On all available points of the coasts, light-houses have been erected, and there are numerous floating-light vessels moored to detached banks. The traffic on the North sea is enormous. It is surrounded by countries whose inhabitants have from the earliest times been famous on the seas, and the enterprise and national bias that formerly covered the Scandinavian waters with conquering fleets, may now be traced in the vast commercial intercourse carried on on the North sea.

NORTH SEA CANAL, or Amsterdam Canal. The rapid increase of the trade of the ports to the southward and eastward of the Helder made it imperative for the merchants of Amsterdam to provide better communication with the North sea than that afforded by the north Holland canal already noticed. In 1865 a company was formed to construct a canal nearly in a direct line to the North sea from Amsterdam, through lake Y and Wyker Meer, 16½ miles. Mr. Hawkshaw and Herr Dieks were appointed engineers. The canal terminates in the North sea, in an artificial harbor, inclosed by two piers of concrete on a foundation of rough basalt. Each is 5,069 ft. long, and the area inclosed is about 260 acres. A cutting 3 m. in length through the sand-dunes follows, involving the excavation of 6,213,000 cubic yards. Between Wyker Meer and lake Y another cutting 327,000 cubic yds. occurs. There is a set of locks at each end, and the average section of the canal is: water-level, 197 ft.; bottom, 89 ft.; depth, 23 feet. The cuttings were first made, and the material was deposited in two banks, 443 ft. apart, through the lakes, the total length of bank being 38½ miles. These enable about 12,000 acres, once covered by water, to be reclaimed, and for this purpose there were set up three Appold pumps, the largest ever made, the fans being 9 ft. in diameter, maximum lift 9 ft. 9 in.; at the ordinary working lift, the three discharge 2,700 tons a minute. Visitors to the American exposition of 1876 will remember the splendid set of drawings and pictures of this canal, the most gigantic work of the kind yet undertaken. The contract sum was originally over $12,000,000.

NORTHUMBERLAND, a co. in e. central Pennsylvania, bounded on the w. by the Susquehanna river and its w. branch; drained by them and the n. branch of Susquehanna, and by Shamokin and Mahonoy creeks; on the Delaware, Lackawanna, and Western, Northern Central, Sunbury, Hazleton, and Wilkesbarre, and Sunbury and Lewistown railroads; 490 sq.m.; pop. '80, 53,123—48,364 of American birth. The surface is irregular and hilly, with fertile valleys between. The principal productions are Indian corn, oats, wheat, buckwheat, potatoes, and hay. There are many tanneries, currier's shops, saw, flour, and planing mills, manufactories of machinery, metal wares, clothing, carriages, and harness. Co. seat, Sunbury.

NORTHUMBERLAND, a co. in e. Virginia, bounded on the e. by Chesapeake bay, and on the n.e. by the mouth of the Potomac river; 200 sq.m.; pop. '80, 7,927—7,907 of American birth; 3,484 colored. The surface is undulating and heavily wooded in parts, and much of the soil fertile. The principal productions are Indian corn, wheat, oats, potatoes, and sweet potatoes, wool, and sorghum molasses. Co. seat, Heathsville.

NORTHUMBERLAND, the most northern co. of England, is bounded on the e. by the North sea, and on the n.w. by the Scottish counties of Roxburgh and Berwick. Area, 1,290,312 statute acres; pop. '71, 386,646. The surface of the county has a rugged, and especially in the w. and s.w. a naked and barren aspect. The Cheviots run along the western border of the county, and send out spurs toward the e., which, gradually declining, are separated by fertile valleys, that widen as they approach the coast. About one-third of the area of the county is occupied by moorland, and along the Cumberland border the broken and bleak-looking hills are valuable for their lead mines. Allenheads, the center of the lead mining district, is the highest inhabited spot in England, being 1400 ft. above sea-level. The inclination of the surface toward the e. is indicated by the direction of the rivers Alne, Coquet, and north Tyne, which with the Tyne and Till are the principal rivers of the county. The Tweed forms the boundary of the county on the n. for about 5 miles, and the s. boundary is formed in part by the Derwent and Tyne. The climate is cold, but is milder on the coast than amid the hills, which, however, produce sufficient herbage for the maintenance of large flocks of "Cheviot" sheep. The principal agricultural tracts occur along the coast, and inland along the river valleys for several miles. In these districts, the soil, for the most part, is a strong fertile clayey loam, productive in wheat, barley, beans, and clover. Agriculture is pursued on the most improved methods, and cattle, chiefly short-horned, are extensively reared. The s.e. portion of the county forms a part of the great Northumberland and Durham coal-field, which produces about 25,000,000 tons annually. There are upwards of 100 pits in operation in the county. Northumberland is traversed by the Newcastle and Carlisle, North-Eastern and Border Counties railways. The county returns four members to the house of commons; the county town is Alnwick (q.v.).

NORTHUMBERLAND, a co. in n.e. New Brunswick, on the gulf of St. Lawrence, drained by the Miramichi river and its branches; 4,760 sq.m.; pop. '71, 20,116. Co. seat, Newcastle.

NORTHUMBERLAND, a co. in Ontario, Can., bounded on the s. by lake Ontario, intersected by the Grand Trunk, and Cobourg, Peterborough, and Marmora railroads; 745 sq.m.; pop. '71, 39,086. Co. seat, Cobourg.

NORTHUMBERLAND, DUKES OF. See PERCY, *ante*.

NORTHUMBRIA, a kingdom in the Saxon heptarchy, made a separate kingdom by Ida in 547, who united the two kingdoms of Bernicia and Deira. It stretched to the firth of Forth, and comprised the territory n. of the Humber. Again divided upon Ida's death, it was once more organized into one kingdom by Ethelfrith in 593. Under Oswald, in the middle of the 7th c., it was the strongest kingdom in the heptarchy. Its separate existence was brought to an end by Egbert in 827. The name survives in the modern county of Northumberland.

NORTH WALSHAM, a small market t. of England, in the co. of Norfolk, on an acclivity on the right bank of the Ant, 14 m. n.n.e. of Norwich, Its market-cross, repaired after the great fire in 1600, by which the town was almost entirely burned down, dates from the reign of Edward III. Pop. '71, 2,842.

NORTH-WEST PROVINCES, a great political division of British India (see INDIA), between Nepaul and Oude on the n.e., and Rajpootana and the Indore agency on the s.w., consisting of seven subordinate divisions—Meerut, Kumaon, Rohilcund, Agra, Jhansi, Allahabad, and Benares. Each of these divisions comprises from three to six districts. They are treated under separate articles. The area of the North-West Provinces is 81,403 sq.m., and the pop. in '72 amounted to 30,781,204. The capital is Allahabad.

NORTHWESTERN UNIVERSITY, at Evanston, Ill., a Methodist university chartered in 1851, but not fully organized until several years later. The endowment is in real estate of uncertain value, but is estimated at $800,000: annual income, $40,000. The university grounds are on the shore of lake Michigan, and, together with the buildings, are valued at 300,000. The principal buildings are university hall, containing the chapel, library, museum and recitation rooms; Heck hall, used by the theological department; and the woman's college of literature and art. The university, besides a preparatory school, embraces seven departments, each with a separate faculty, as follows: 1. A department of literature and science; 2. department of technology; 3. department of literature and art, formerly the Evanston college for young ladies; 4. conservatory of music; 5. department of theology, or Garrett Biblical institute; 6. department of law; 7. department of medicine. The library contains 30,000 volumes, and has a fund of $60,000 at interest, to be ultimately used in erecting a fire-proof library building. The Garrett Biblical institute, on the university grounds, has a distinct charter and board of trustees, but sustains a coöperative relation to the university. The museum contains 15,000 specimens. Professors in all departments (1880), 87; students in all departments, 703; alumni of all departments, 1174. A thorough preparatory school is maintained with a distinct building and faculty. President (acting), Oliver Marcy, LL.D.

NORTHWEST TERRITORIES, the designation of all that portion of British North America under the dominion of Canada, except the provinces of Manitoba and British Columbia, lying w. and n. of the provinces of Quebec and Ontario. On the n. it is bounded by the Arctic ocean, on the e. by the Atlantic, on the w. by the Pacific, and on the s. by parts of Canada and the United States. Its length e. and w. is about 2,500 m.; breadth of the mainland n. and s., 1500 m.; and its estimated area, including the islands in the Arctic ocean, about 2,750,000 sq. miles. A great portion of the region consists of inland seas, bays, lakes, rivers, swamps, treeless prairies, and barren hills and hollows. By one explorer it has been not inaptly called "the fag end of the world." In the s.w. the face of the country is level or rolling; farther e. the surface is broken and there are mountains 1000 ft. high; and on the Atlantic coast there are rocks, lakes, swamps, and mountains. The extreme n. is intersected with lakes, marshes, and rivers to a greater extent than any other portions of the globe that have been explored. The country immediately s. and w. of Hudson's bay is generally well wooded and has a fair soil. The principal rivers of the territories are the Churchill, Nelson, Severn, Albany, Abbitibbi, East Main, and Great Whale rivers, flowing into Hudson's bay; the MacKenzie, Coppermine, and Great Fish rivers, flowing into the Arctic ocean; the Saskatchawan, Assinniboin, and Red rivers, falling into lake Winnepeg; and the Caniapuscaw and Natwakame rivers, falling into Hudson's strait. The chief lakes are the Great Bear, Great Slave, Athabasca, Winnepeg, Manitoba, Lake of the Woods, Winnepegoos, Clearwater, Nelson, Deer, Wollaston, North-Lined, Mistassini, and Abbitibbi. The geology of the region is not accurately known; but the western limits of the Hudson's bay basin are believed to be in part marked off by hills of metamorphic rock, and the iron and lignite-bearing beds of Colorado and Wyoming appear to continue northward to the Arctic ocean. About 30 m. s. from this sea copper has been found in small quantities on the Coppermine river. The climate is severe and in the greater portion of the territories agriculture is not practicable. In the n. the land is never thawed more than a few inches even in midsummer, and from the middle of October to the middle of May the country is buried under snow, while the smaller rivers and lakes are frozen to the bottom. In the w., however, the temperature is somewhat higher, and in the s. very variable, the range being 140°. A region commencing at the 100th meridian and 49th parallel and extending n.w. to the 52d parallel and 118th meridian embraces about 50,000 sq.m. that has a prairie hay which preserves its flavor and nutritive properties throughout the winter and provides the herds of buffalo with food. Here and there along the principal rivers and around the larger lakes are tracts capable of cultivation. The best of these localities are the valley of the Peace river, the district along the upper waters of the Athabasca and the upper valley of the Saskatchawan. Of the wild animals that are found the buffalo, beavers, sables, martens, wolves, foxes, bears, and others are very numerous, making the territories the most important fur-producing portion of the world. The musk-ox and some species of deer are also abundant, and the seal and walrus are found on the shore of the Arctic ocean. The principal rivers and lakes are well-stocked with fish, including perch, carp, pike, whitefish, and sturgeon.

The history of this immense region dates back to 1610 when Hudson's bay was discovered by John Hudson, an English navigator. Sixty years later Charles II. granted a great tract within its limits to prince Rupert, the duke of Albemarle, and others, who organized the Hudson's bay company to carry on the fur trade. This tract by the original charter was called "Rupert's land;" and it constituted one of the king's colonies or plantations in America and was defined as all the lands and territories upon the countries, coasts, and confines of the seas, bays, lakes, rivers, and sounds, in whatsoever latitude they might be, that lay within the Hudson's straits, and that were not already possessed by the subjects of any other kingdom. Up to 1870 the whole region was known as the Hudson's Bay territory and was governed by the Hudson's Bay company, by whom it was divided into four large departments or regions which were subdivided into 33 districts, including 155 trading posts. The government was administered by a chief governor and council, and the various departments by chief factors and traders. But in 1869 the company relinquished governmental functions, and during the following year the Northwest Territories came into the possession of Canada and were made a province. The scanty population is mostly Indian or half-breeds, and the various tribes together are believed to number about 60,000 persons. They subsist by hunting, trapping, and fishing. The white inhabitants, scattered at the various posts of the Hudson's Bay company, and employed by the company are mostly Scotch and French Canadians, and number about 3,000. There are numerous Roman Catholic, a number of Anglican, and a few Methodist and Presbyterian missions among the Indians, many of whom have become civilized and embraced the Christian religion. The most important settlement is York Factory, on Hudson's bay near the mouth of the Nelson river, communication is had in the winter season between this place and fort Garry in Manitoba, the headquarters of the Hudson's Bay company in America, by means of dog sledges, and in summer by means of canoes and boats on the streams. The government of the territories is vested in a lieut.gov. and a council of not more than five members, appointed by the gov.gen. of Canada in council. As soon, however, as any district of not more than 1000 sq.m. contains 1000 adult inhabitants, it is entitled to elect a member of the council for two years, and a second member when the inhabitants number 2,000. The seat of government is Battleford, a town situated at the junction of Battle river with the north fork of the Saskatchawan, and on the Canadian Pacific railroad, about 500 m. w.n.w. of Winnepeg.

NORTON, a co. in n.n.w. Kansas, adjoining Nebraska, drained by the n. fork of Solomon river, by Prairie Dog creek, and the tributaries of Republican river; 900 sq.m.; pop. '80. 7,002—6,525 of American birth. The surface is nearly all prairie, and the soil fertile. The principal productions are wheat and Indian corn. Co. seat, Norton.

NORTON, Andrews, Rev., American scholar and theologian, was b. at Hingham, Mass., Dec. 31, 1786. Having graduated at Harvard College in 1804, he was appointed, in 1809, a tutor of Bowdoin college, and in 1811 mathematical tutor at Harvard, and in 1813 librarian of the university, and succeeded Dr. Channing as lecturer on biblical criticism and interpretation. In 1819 he was appointed Dexter professor of sacred literature, which office he retained until failing health compelled his retirement in 1830. Dr. Norton was, after Dr. Channing, the most distinguished exponent of Unitarian theology, a clear and perspicuous lecturer, an able and conservative critic, and a voluminous writer. Rejecting the doctrine of the Trinity, and protesting against Calvinism, he also opposed the school of Theodore Parker and the naturalistic theology. Besides his contributions to the *General Repository and Review*, the *North American Review*, *Christian Examiner*, he published (1833) *A Statement of Reasons for not believing in the Doctrine of the Trinity;* (1737) *The Genuineness of the Gospels;* (1839) *On the Latest Forms of Infidelity;* and left some poems and a translation of the gospels. He died at Newport, R. I., Sept. 18, 1853.

NORTON, the Hon. Caroline Elizabeth Sarah, a poetess and novelist of some reputation, the daughter of Thomas, and the granddaughter of Richard Brinsley Sheridan, was b. in 1808. Her father died while she was still a child, and her education, which embraced an unusually varied course of studies, was superintended by her mother. In 1827, she married the hon. George Chappel Norton. In 1831 she first met lord Melbourne, then prime-minister, and the intimacy which succeeded having given rise to some scandalous rumors, Mr. Norton brought an action against lord Melbourne, which resulted in a verdict for the defendant. She died June 15, 1879, after having been for some months the wife of sir W. Stirling Maxwell. Her chief works are *The Sorrows of Rosalie* (1827); *The Undying One* (1830); *The Child of the Islands* (1845); *Stuart of Dunleath*, a novel (1847); *English Laws for Women in the Nineteenth Century* (1854); *The Lady of Garage* (1862); *Lost and Saved*, a novel (1863); and *Old Sir Douglas* (1868); Her prose works, several of which depict the wrongs incident to the position of women, are written with considerable cleverness and vigor; and her verse, though overstrained and stagy in sentiment, has numerous admirers, and manifests some degree of that brilliancy for which the Sheridans have been so famous.

NORTON, Charles Eliot, b. Mass. 1827; son of the Rev. Dr. Andrews Norton. After graduating at Harvard college, in 1846, he entered a commercial house in Boston to learn the details of the East India trade. In 1849 he went out as supercargo of a ship consigned to India, through which he traveled, returning to Boston by way of Europe. In 1855 he again went to Europe where he spent two years, and he was once more abroad 1868-73. In 1875 he was appointed professor of fine arts at Harvard college. In 1855 he edited, in conjunction with Dr. Ezra Abbot, his father's *Internal Evidences of the Genuineness of the Gospels*, and translation of the gospels. He edited the *North American Review*, in association with James Russell Lowell, 1864-68, and during the rebellion he edited the publications of the loyal publication society at Boston. His *Considerations on some recent Social Theories* appeared in 1853; *Notes of Travel and Study in Italy*, 1860; and his translation of Dante's *Vita Nuova* in 1867. He is an accomplished Dante scholar, and Karl Witte's edition of the *Vita Nuova* is dedicated to him. He published in 1880 *Historical Studies on Church Building in the Middle Ages.* He is president of the archæological institute of America.

NORTON, John, 1606–63; b. Stortford, Hertfordshire, Eng.; educated at Cambridge; became curate of Stortford. Having embraced Puritanism he came in 1636 to Plymouth, Mass., where he preached the first winter; was pastor of the church in Ipswich in 1636; was a member of the convention which framed the "Cambridge platform" in 1648; became colleague of the Rev. John Wilson, minister of the first church in Boston in 1652, and in 1662 went with gov. Bradstreet as agent of the colony to present an address to Charles II. after the restoration. He wrote many works, one of which was a treatise against the Quakers, entitled *The Heart of New England rent by the Blasphemies of the Present Generation,* by which they were so enraged that after his death they informed the king that "John Norton, chief priest in Boston, was smitten and died by the immediate power of God."

NORTON, William E., b. Mass., 1843; was apprenticed when young, to a house, sign, and fresco painter; went to sea at the age of 18; at 22 he commenced marine painting in which he became successful.

NORWALK, a township of Connecticut, on both sides of the mouth of the Norwalk river and Long island sound, on the New York and New Haven railway, 45 m. n.e. of New York, and 31 s.w of New Haven. It has manufactories of iron, machinery, hats, felt-cloth (of which two companies make 500,000 yds. per annum,) 16 churches, etc. Pop. '70, 12,119.

NORWALK (*ante*) a t. in Fairfield co., Conn., has a fair harbor and is the terminus of the Danbury and Norwalk, and the Shepaug Valley railroads; pop. '80, 13,956. There are several public halls, a public library, schools and academies, 5 banks, 15 churches, 2 daily papers, several hotels and a large number of mills, foundries and factories. The lock-works and iron-works are among the most extensive in the country. The people are largely engaged in the oyster trade, sending great quantities to New York annually. There are two or three hot-house nurseries, and a large trade in flowers is carried on with New York city. Woolen goods, hats, shoes, and straw articles are among the manufactures. That portion of the township lying upon the Sound and through which the New York railroad passes is known as South Norwalk. In the upper or north portion of the town, which is built upon rising ground, are many pleasant residences and country seats. The union school building is one of the handsomest in the state, and there are several private academies.

NORWALK, a t., the co. seat of Huron co., Ohio, 56 m. w. of Cleveland, on the Lake Shore and Michigan Southern railroad, pop. '70, 4,498. It is situated on a long sandy ridge, with streets paved with double rows of maples. It has gas and water works, flour and saw mills, machine-shops and foundries. There are churches, schools, banks, and 4 weekly newspapers.

NORWAY (Norweg. *Norge*), the western portion of the Scandinavian peninsula, which, together with Sweden, forms one joint kingdom, is situated between 57° 58′ and 71° 10′ n. lat., and 5° and 28° e. long. It is bounded to the e. by Sweden and Russia, and on every other side is surrounded by water, having the Skagerrak to the s., the German ocean to the w., and the Arctic sea to the n. Its length is about 1,100 m., and its greatest width about 250 m.; but between the lats. of 67° and 68°, it measures little more than 25 m. in breadth. The following table shows the areas and populations of the 20 aemter into which Norway is divided, as given in the last census of Jan., 1876:

Aemter.	Area in English sq. miles.	Population in 1876.
Smaalenene	1,548	107,629
Akershuus	1,986	114,778
Christiania	2	77,041
Hedemarken	10,034	119,774
Christians	9,670	115,988
Buskerud	5,659	101,867
Jarlsberg and Laurvik	861	89,330
Bratsberg	5,707	83,966
Nedenæs	3,855	75,979
Lister and Mandal	2,423	77,306
Stavanger	3,421	114,164
Sön re Bergenhuus	5,854	121,527
Bergen (town of)	1	34,284
N. Bergenhuus	7,045	86,205
Romsdal	5,650	116,838
S. Trondhjem	7,084	116,814
N. Trondhjem	8,794	81,889
Nordland	14,660	103,579
Tromsö	9,720	53,957
Finmarken	18,306	24,232
Total	122,280	1,817,237

Of this total, only 332,938 live in towns. At the preceding census on Dec. 31, 1865, the population was 1,701,756.

The Scandinavian peninsula consists of more or less connected mountain masses, which, in the s. and w. parts of Norway, constitute one continuous tract of rocky highlands, with steep declivities dipping into the sea, and only here and there broken by narrow strips of arable land. South of Trondhjem (63° n. lat.), the ridge expands over nearly the entire breadth of Norway. The n. portions of the range, known as the Kjöllen Fjelle,* occupy a space of about 25 m. in width and form, as far n. as 69°, the boundary-line between Sweden and Norway. South of 63° n. lat. the range of the Scandinavian mountains is known as the Norska, or Dovre Fjelle, although the latter name belongs properly only to the part immediately in contact with the Kjöllen. The general elevation of the Norska Fjelle does not rise above the line of perpetual snow, whose average height in these latitudes is 5,000 ft.; but it ranges above that of the growth of trees, which may be stated to lie 1000 ft. lower. Only two carriage-roads traverse the Norska Fjelle, the one connecting Christiania with Bergen, and the other with Trondhjem. The Justedal glacier, in Bergen amt, is the largest on the continent of Europe, and covers an area of 588 sq. miles. The whole of the w. coast of Norway is densely fringed with islands and isulated rocky masses, which, n. of 68°, in the Lofoden (q.v.) group, assume larger dimensions, and form extensive insular districts. The more important are Hindö (857 sq.m., 8,190 inhabitants), on the borders of Nordland and Tromsö; Langö (147 sq.m., 5,812 inhabitants); Karmö (only 21 sq.m., although the pop. is 11,827); and Senjen (278 sq.m., with 3,339 inhabitants). To the s. of the Anden group, near the little islands, Mosken and Værö, occurs that eddying whirl of counter-currents known to us as the Maelström; but with this and a few other similar exceptions, no serious obstacles impede navigation along the numerous channels of the coasts. The most important of the rivers are the Glommen (350 m. long, with a basin of 6,657 sq.m.), the Drams-elv, of less than half the length and basin, Tanæ, Pasvikel, Skiens, Laagen, and Vormen. These and numerous other streams are of more importance for floating down timber to the fjords than for navigation. The fjords or inlets form a characteristic feature of Norwegian scenery, and give a coast-line of upwards of 800 miles.

The most considerable of the lakes of Norway is the Mjösen, near Christiania; but even this lake, which in some places is more than 1400 ft. deep, is scarcely 60 m. long, and has an area of less than 200 sq. miles. Swamps and morasses, which occupy a large area, have of late years engaged the attention of the government, which is endeavoring to drain and utilize them for agricultural purposes, and with a view of converting them into fields of turf and peat for fuel.

Climate, Soil, etc.—The peculiar physical character of Norway necessarily gives rise to great varieties of climate in different parts of the country. The influence of the sea and of the gulf stream, and the penetration into the interior of deep inlets, greatly modify the severity of the climate, more especially on the w. coast. Thus, while the mean annual temperature is for Christiania, on the e. coast, 41°, it is 46°.8 Fahr. for Bergen on the w. coast, which is only 30′ further north. On the coast generally, rain and fogs prevail; while in the regions near the North cape, storms are almost incessant. In the interior, the air is clear and dry, and the winters are cold and the summers hot, while on the coasts the opposite conditions prevail. The longest day, which in the s. is 18 hours, may be said to be nearly three months in the high latitudes of the n. districts, where the longest night lasts almost an equal length of time. The protracted winter of the n. regions follows almost suddenly on the disappearance of the sun, when the absence of solar lights is compensated for by the frequent appearance of the aurora borealis, which shines with sufficient intensity to allow the prosecution of ordinary occupations.

It is estimated that $\frac{1}{38}$th of the area of Norway lies within the region of perpetual snow, while elevations exceeding 2,000 feet above the level of the sea are unfitted for human habitations, although for a portion of the brief summers, the herdsmen can occupy *sætre* or huts at elevations of 3,000 feet and upwards. A large extent of the mountain districts yields no produce beyond scanty grasses, mosses, lichens, and a few hardy berry-yielding plants. Only birch and juniper grow n. of 67, which is the boundary of the pine. The Scotch Fir. *Pinus sylvestris* (Norwegian, *Fnrn*), and Spruce, *P. abies* (Norwegian, *Gran*), cover extensive tracts, and with birch, constitute the principal wealth of Norway. The hardier fruits, as strawberries, gooseberries, cherries, and raspberries, are abundant and excellent of their kind. Hemp, flax, rye, oats, and barley are grown as far north as 66; but although agriculture has been more systematically pursued of late years, the crops are not always sufficient for home consumption, and hence it is found absolutely necessary annually to import considerable quantities of corn and potatoes. The frugal peasantry do not, however, rely wholly upon importation, but prepare a species of cake or bread from the bark of the pine when corn is scarce, and in plentiful years store away some of the produce of the harvest in the national corn-magazines, which are established in every part of Norway by way of a provision for an unfavorable season. Agriculture is most successfully prosecuted in the amts of Jarlsberg and Laurvik, and in the south generally; while in the northern parts, in the upper valleys, the rearing of cattle constitutes an important branch of industry. The herds and flocks are driven from the distant farms to the pasture-lands in these high mountain valleys, known as Sæterdale, where they remain till the approach of cold weather obliges the herdsmen to return with their charges to the shelter of the farms. Although the cattle and horses are small, they are generally strong and capable of bearing much hard labor.

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* *Fjelle* is the plural of *fjeld*, a mountain-side.

Products, etc.—Fish are caught in almost every stream and lake of the interior, as well as in the fjords of the coast, and in the bays and channels which encircle the numerous islands skirting the long sea-line of Norway. Salmon, herring, and cod are of the greatest importance, and together give occupation to upwards of 50,000 men, who pursue the herring and cod fishing in the spring, and again in the summer, while cod is also fished in the winter-time. The value of the fish, fresh and dried, exported from Norway in 1870, was 7,981,000 sp. d.,* although that year was unfavorable in regard to the returns of deep-water fish. The average annual value of the fish and oil produce is between 9 and 10 millions of sp. d. In 1869 there were 38,000 men employed in the herring fisheries, and the value of the fish for that year was 250,000 sp. d. In the same year 15 Norwegian ships were engaged in the Jan Mayen (70° n. lat.) seal fisheries, when 33,000 young and 29,000 old seals were taken, and the profits of the captures were 45,000 sp. d. Next to the fisheries, Norway derives its greatest sources of wealth from the produce of its woods. In 1870 there were 850,000 tons weight of timber (both deals and unhewn trunks) exported, of the net value of 7,600,000 sp. d. Within the last few years the Norwegian forests have yielded a new product of industry, known as wood-paste, extensively employed in the manufacture of paper, for which it promises to serve as a cheap and efficient substitute for rags.

The fauna of Norway includes the bear, wolf, lynx, elk, otter, reindeer, red-deer, seal, the eider-duck and many other kinds of sea-fowl, blackcock, capercailzie, and a great variety of small game. According to the census of 1865, there were in Norway 149,167 horses, 953,036 horned cattle, 1,705,394 sheep, 290,985 goats, 96,166 swine, 101,768 reindeer.

The mineral products, which comprise silver, copper, nickel, cobalt, iron, chrome ironstone, etc., yield a large annual return. The value of the metal exports was, in 1870, 835,000 sp. d. for raw and partially worked ores, and 16,000 sp. d. for wrought metals. The richest mines are situated in the south, and chiefly in the district of the Glommen, as the celebrated and ancient silver-works of Kongsberg, the copper mines of Röraas, Alten, and Vigsnæs, the nickel mines of Modum and Bamhle, and the cobalt-works of Buskerud, and the numerous iron shafts on the southern declivities of the mountains between Kongsberg and the Glommen. Latterly, however, some productive copper-works have been opened in the northern districts of Kaafjord in Finmark.

Ship-building in all its branches is almost the only industrial art that is extensively and actively prosecuted. In many parts of the country there are absolutely no special trades, the inhabitants of the small fishing-ports, no less than the inmates of the widely separated farms, employing their compulsory leisure during the long winter in weaving, spinning, and making the articles of clothing and the domestic implements required in their households.

Trade, etc.—The principal seats of trade are Christiania, Drammen, Arendal, Bergen, Stavanger, and Trondhjem. The merchant fleet numbered, in 1874, 7,447 vessels of 1,220,000 tons, manned by 56,147 seamen. In 1873, 13,404 vessels cleared the ports of Norway. The exports, which consist mainly of timber, fish, minerals, furs, feathers, and down, amounted in 1873 to 33,987,000 sp. d., or about £7,000,000; while the imports for the same year were 45,859,000 sp. d., or £10,300,000 sterling. The value of the exports to Great Britain in 1877 was £5,295,000, the imports thence being valued at £1,728,000. The imports consist not only of the ordinary colonial goods, and objects of luxury, but in a large proportion of the most necessary articles of consumption, as cereals to the annual amount of 2,000,000 tons, salt in nearly half that quantity, fresh and salted meat, butter, soap, hemp, and flax, sailcloth, tow, oil, wine, tobacco, and manufactured goods of all descriptions. The most important commercial relations of Norway are with Great Britain and Germany. Russia and Denmark stand next in order as importers to Norway, while the Catholic countries of the Mediterranean are the principal purchasers of the smoked and dried Norwegian fish.

Revenue, etc.—By the budget for 1876–77, the revenue was estimated at 39,200.00 kroner (the *krone*, worth 1s. 1¼d., having in 1875 superseded the old *specie-daler*), or about £2,190,420, the expenditure being presumed to equal the receipts. The national debt of Norway amounted in 1875 to 48,307,600 kroner.

Administration, etc.—Norway is divided into 20 amts, or administrative circles, as given in the table. The circles are subdivided into 56 fogderier (bailiwicks), each presided over by a rural magistrate, and containing in all 446 herreder, or administrative districts, which have similarly their own judicial or official heads. Norway has a representative government, based on the constitution which was established in 1814, and ratified at Eidsvold. The Storthing, or legislative chamber, meets annually, and is composed of representatives who are elected by deputies who have been selected for the purpose of nominating the members. These deputies are elected by a system of almost unrestricted universal suffrage, the only qualifications necessary being the attainment of the age of 25, and the possession of property in land to the value of 150 sp. d., or a five years' tenancy of such property. The election of the deputies takes place every third year, when the electors meet in their respective parish churches, and choose deputies, whose number is in the proportion of 1 to 50 voters for towns, and 1 for 100 in rural districts. These deputies then select from their own body, or from among other eligible persons, the representatives for the Storthing, which is further subdivided into two distinct chambers, the Lagthing and Odelsthing, with the former of whom rests the framing legislative and financial measures, and with the latter the power of accepting or rejecting them, and the right of taking cognizance of the conduct of the ministers, judges, and other officers of the state. The members of the Storthing receive an allowance for their time and traveling expenses during the session. The Storthing votes the taxes, which are collected by officers of the king of Sweden and Norway; it proposes laws, which must be ratified by the king; but if they pass the Storthing three times, they acquire validity even without the king's sanction. Although Norway constitutes one joint kingdom with Sweden in regard to succession, external policy and diplomacy, it is in all other respects an independent state, having its own government, legislative machinery, finances, army, and navy. The king is indeed commander-in-chief of all the forces of the country, whether military or naval; but he can neither augment nor decrease their number, nor proclaim peace or war without the assent of the Norwegian Council of State, which must consist of ten members, natives of the country; nor, excepting in time of war, can he bring foreign soldiers within the frontiers, or send native troops out of Norway. In accordance with the constitution, no title can be conferred independently of the tenure of office, and no one can be raised to the rank of a noble; while with the death of the members of the few still surviving noble families who were born before 1821, all personal honors, privileges, and distinctions belonging to the nobility will cease. The constitution may therefore be regarded as purely democratic in its character. The council of state constitutes the highest court of justice, under whose jurisdiction the provincial magistrates or *amtmaend* administer justice, in conjunction with the bailiffs and *sorenskriver* or advocates, who preside over petty rural courts. These lower courts are controled by the *Stift* or diocesan courts of justice; while the latter are, in their turn, under the high court of appeal, or *Höieste Ret*, which is located at Christiana.

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* The specie daler is worth about 4s. 6d.

Religion, etc.—The Lutheran is the predominant church, to which all persons holding public offices of trust must belong, although freedom is allowed to all other Christian denominations and to Jews. The church is under the administration of six bishops, whose sees are Christiania, Christiansand, Trondhjem, Bergen, Hamar, and Tromsö. There are 80 deaneries, 437 higher rectories, 960 parish and district, town and country churches in all. There were, in 1870, 532 beneficed clergymen, and 337 theological candidates without fixed preferment. The whole number of dissenters in that year did not exceed 5,200. The clergy who receive tithes, exercise considerable influence in remote country districts, where they frequently are called upon to settle disputes, and exercise various judicial functions. Much has been done of late years in Norway for the diffusion of knowledge, and provision is now made to extend education to the inhabitants of the most inaccessible districts by means of itinerant teachers, a certain number of whom, corresponding to the number of farms in each parish, are nominated to the office of schoolmaster. These men proceed from house to house, being supplied with a schoolroom, and fed and entertained by each householder in succession for the number of days at which the farm is mulcted; and by the aid of these means, education is so universally diffused that it is rare to meet with Norwegians who cannot read and write. In 1869 there were 150 higher poor schools, 15 normal schools for the parish-school teachers, 96 higher private schools, 15 military, naval, and navigation schools, and 12 polytechnic institutions. The expenses incurred for education were, for the country districts, 365,000 sp. d., and for the towns, 111,367 sp. d. The university of Christiania (q.v.), which was founded in 1811, has 47 professors, and is attended by about 1000 students, amongst whom are the sons of many of the peasant land-owners, who receive a university education without intending to follow the learned professions.

Army, etc.—By the terms of the laws of 1866 and 1876, the army of Norway is composed of troops of the line, the military train, the militia or Landevaern, the civic guards, and the Landstorm, or final war-levy. In 1878 the troops of the line numbered 12,000 men and 750 officers. All young men above twenty-one years of age, are liable to serve, with the exception of the inhabitants of the three northern amts of the kingdom. The fleet numbered, in 1878, 121 vessels, of which 29 were steamers, carrying 142 guns. The navy was manned by 2,400 sailors, but the number of men liable by law to be called upon for naval service in the districts of Norway exceeds 60,000. Horten, in Christiania-Fjord, is the principal naval port. The only fortified spots are Frederickssteen at Frederickshald, Frederickstad, Akershuus, Bergenshuus, Munkholm, and Vardöhuus.

The population of Norway is chiefly rural, only about 11 per cent living in towns. Christiania, the principal city, has 77,000 inhabitants, while Bergen and Trondhjem have respectively only 34,000 and 22,500. The physical character and consequent climatic relations of Norway leave a very small proportion (according to some writers, only about 2 per cent) of the area capable of being cultivated. There are few villages, and the isolated farmsteads are often separated from one another by many miles. The cultivators of the land are in most instances also the proprietors, less than one-third of the whole number being tenants only. Allodial land, known as Udal or Odel, does not descend to the eldest son unconditionally, since all his relatives have a claim upon it, and if it should be sold, have the right of buying it back within the term of five years at the sale-price.

Roads, Railways, etc.—The public roads in Norway are excellent; and traveling is rendered cheap and expeditious by the system established and regulated by law, in accordance with which carriages and horses are provided at fixed rates of payment for travelers passing through the rural districts of the country. This system, which is known as "Skyds," is completely under the control and direction of the authorities, by whom the number of the guest-houses and stations are regulated. The length of the railways in Norway in 1876 was about 340 m.; and the number of letters that passed through the post in 1875 was 8,764,000.

Race, Language, etc.—With the exception of some 20,000 Lapps and Finns, living in the most remote northern regions, the inhabitants of Norway are generally a pure Scandinavian race, akin to the North German nations of Aryan descent. The genuine Norwegians are of middle height, with strong, well-knit, muscular frames, of fair skin, with light flaxen or yellow hair, and blue eyes. In character, they may be said to be frank, yet cautious and reserved, honest, religious, and superstitious, more from an inveterate love of clinging to the forms, thoughts, and creed of their ancestors, than from fanaticism. Their love of country, and the irrepressible fondness for the sea, by the very anomaly which these apparently contraditory propensities exhibit, show them to be the true descendants of the sea-roving Northmen of old. Of late years emigration has continued steadily to increase at a rate which threatens to be a serious evil to so badly populated a country as Norway, but which is easily explained by the small portion of land capable of cultivation. The general diffusion of education, and the perfect equality and practical independence which they have known how to secure and to retain themselves, notwithstanding this nominal incorporation with the other Scandinavian kingdoms, give to the poorest Norwegians a sense of self-respect and self-reliance which distinguish them favorably from those of the same class in other countries. The peasants, more especially in the amts remote from towns, retain their ancient provincial costumes, which are, for the most part, highly picturesque, consisting among the women, of ample woolen skirts and brightly-colored knit bodices, fastened and adorned with silver or brass clasps and buckles. Music is much cultivated by all classes of the people, and the national songs and melodies which are the favorites, are for the most part of a melancholy character.

Danish is the language in ordinary use both in writing and speaking, although dialects near akin to the old Norse are spoken by the dalesmen and mountaineers of special districts. Since the separation of the country from Denmark, a strongly national tendency has been manifested by some of the best Norwegian writers, and attempts have been made to reorganize these dialects into one general Norwegian language, and thus, in fact, to revive the ancient Norse, or Icelandic, which has been preserved in Iceland in almost perfect purity since its introduction to the island in the 9th c. by colonists from the Scandinavian mother-lands. Among the most zealous cultivators of the ancient and modern literature and history of Norway, we may instance Prof. P. A. Munch, whose able expositions of the laws and social conditions of his country have thrown new light on its history; Keyser, Unger, and Hohnboe, who have done much to elucidate the Norse tongue and literature; A. Munch, Bjerregaard, Hansen, and Welhaven the critic successful cultivators of the national lyric; J. Moe and Asbjörnsen collectors and annotators of native sages; Ibsen the dramatist, and Björnsen the delineator of national peasant life. In the more abstruse departments of mathematical and physical science, Norwegians have gained for themselves a foremost place, as is sufficienty testified by the mention of names such as N. H. Abel, renowned for his discoveries in indefinite integrals; C. Hansteen, the astronomer; and Keilhau, the geologist.

History.—The early history of Norway is comprised in that of the other Scandinavian countries, and is, like theirs, for the most part fabulous. It is only towards the close of the 10th c., when Christianity was introduced under the rule of Olaf I., that the mythical obscurity in which the annals of the kingdom had been previously plunged begins to give place to the light of historical truth.

The introduction of Christianity, which was the result of the intercourse which the Norwegians had with the more civilized parts of Europe through their maritime expeditions, destroyed much of the old nationality of the people with the heathenism which they had hitherto cherished, although the sanguinary feuds which had raged among the rival chiefs of the land can scarcely be said to have lost their ferocity under the sway of a milder religion. Olaf II., or the Saint (1015–30), who zealously prosecuted the conversion of his countrymen, raised himself to supreme power in the land by the subjection of the small kings or chieftains, who in the times of heathenism had subdivided the kingdom among them. The war between Olaf and King Knud the Great of Denmark which terminated in 1030 with the battle of Stricklestad, in which the former was slain, brought Norway under the sway of the Danish conqueror; but at his death in 1036, Olaf's son, Magnus I., recovered possession of the throne, and thenceforth, till 1319, Norway continued to be governed by native kings. The death in that year of Hakon V. without male-heirs, threw the election of a new king into the hands of the national assembly, who, after many discussions, made choice of Magnus VIII. of Sweden, the son of Hakon's daughter. He was in turn succeeded by his son Hakon, and his grandson Olaf IV., who having been elected king of Denmark in 1376, became ruler of the sister Scandinavian kingdoms on the death of his father in 1380. This young king, who exercised only a nominal sway under the guidance of his mother queen Margaret, the only child of Valdemar III. of Denmark, died without heirs in 1387. Margaret's love of power and capacity for government brought about her election to the triple throne of the Scandinavian lands, and from this period till 1814, Norway continued united with Denmark; but while it shared in the general fortunes of the latter state, it retained its own constitutional mode of government, and exercised its right of electing to the throne, until, like the sister-kingdom, it agreed of its own free will to relinquish this privilege in favor of hereditary succession to the throne. See DENMARK, HISTORY OF. The Napoleonic crisis may be said to have severed this union, which had existed for more than 400 years, for Denmark, after having given unequivocal proofs of adhesion to the cause of Bonaparte, was compelled, after the disastrous war of 1813, to purchase peace at the cost of this long united partner of her state. Crippled in her resources, and almost bankrupt, she saw herself constrained to sign the treaty of Kiel in 1814, by which it was stipulated by the allied powers that she should resign Norway to Sweden, receiving in return, by way of indemnity, some portion of Swedish Pomerania and the island of Rügen, which were subsequently exchanged with Prussia for Lauenburg on the payment by that state of two million rix-dollars. The Norwegians, having refused to admit the validity of the treaty of Kiel, nominated Prince Christain, the heir-presumptive to the throne of Denmark, regent and subsequently king of Norway. The nomination was made by the national diet, or storthing, which met at Ejdsvold, where they drew up a constitution based on the French constitution of 1791. These measures found, however, neither supporters nor sympathizers among the other nations; and with the sanction of the great allied powers, Charles John Barnadotte, crown-prince of Sweden, led an army into Norway, and after taking Frederickstad and Frederickshald, threatened Christiania. Denmark being unable to support the cause of prince Christian, and Norway being utterly destitute of the means necessary for prosecuting a war, resistance was of no avail, and the Norwegians in this untoward conjuncture of affairs, were glad to accept the proposals made to them by the Swedish king for a union with Sweden, on the understanding that they should retain the newly promulgated constitution, and enjoy full liberty and independence within their own boundaries. These conditions were agreed to, and strictly maintained; a few unimportant alterations in the constitution, necessitated by the altered conditions of the new union, being the only changes introduced in the machinery of government. Charles XIII. was declared joint king of Sweden and Norway in 1818, and while the latter has become an almost independent state, it is questionable whether the former has found in its nominal acquisition an equivalent for the loss of Finland, which was the price exacted for it by the allied powers, and made over to Russia. Since the union, Norway has firmly resisted every attempt on the part of the Swedish monarchs to infringe upon the constitutional prerogatives of the nation; and during the reign of the first Bernadotte dynasty, the relations between him and his Norwegian subjects were marked by jealousy and distrust on both sides; but, since his death, the people generally have been more contented, and Norway has continued to make rapid progres towards a state of political security and material prosperity far greater than it ever enjoyed under the Danish dominion.—See T. Thorlak, *Historia rerum Norvegicaram* (Copenh. 1711); Schöning, *Noryes Riges Historie* (Soroe, 1771); Munch, *Det Norske Folk's Historie*, vols. 1 to 8 (Christ. 1852–63); *Bridrag til Norges Officiela Statistik*, 1871.

NORWAY HADDOCK. See BERGYLT.

NORWEGIAN LANGUAGE AND LITERATURE (NORWAY, *ante*). The great Teutonic stem divides at about the time of the invasion into four dialects; but whether these dialects antedate the year 500 A.D. is very doubtful. The Gothic of Ulfilas is, undoubtedly, the oldest; but the Saxon follows not long after. The high German, by the testimony of charters, only begins after the battle of Tolbiac (Zuelpich). The Norwegian, if by this we understand the *Izlendska tunga* (Icelandic), though at most of the 12th c. represents a dialect at least 100 years earlier, and allows us to supply missing Gothic forms better than any other. Perhaps its great changes may be referred to the 8th c.; and they are greater than those of either Saxon, or high German. They are: (*a*) great contraction and assimilation; (*b*) dropping of case-endings; (*c*) dropping of prefixes; (*d*) an harmonious system of vowels, but accomplished by umlaut and reflex, more like Saxon than German; (*e*) assimilation of vowels; (*f*) the suffixed article; (*g*) w before r, l, and u is dropped; (*h*) j initial dropped; (*i*) w is vocalized. The real test is the introduction of new terms, as georwa, Scotch gar, and taka, take, replace, thuwa, do, and nimma, niman, Ang.-Sax. Also, at, ok, replace, ettu, ekende, to, and. About 1120 A.D. lived Thorodd, the grammarian; and in his time certain changes had already taken place in a contraction which involved the loss of *n* final in verbs and in weak nouns. He specifies vowels. *a* short, as in father; *a* long (an) as in hall; *æ* short, as in man; *æ* long, as in were; *e* short, as in red; *e* long, as in they; *i* short, as in it; *i* long, as in sweet; *o* short, as in not; *o* long, as in row; *u* short, as in foot; *u* long, as in food; *y* short, as in une (French), kuechen (German), *y* long, as in duke, nieuw (Dutch); *æ* short, as in hurt; *æ* long, as in earth; *eo* short, as in seuil (French); *eo* long, as in boy. Three diphthongs—*au*, *ei*, and *ey*—all with a distinct sound for each letter as above. Every vowel could be nasalized. *B*, *p*, *m*, *n*, *k*, *l*, *t*, and *d* as in English; *c* and *g* always hard; *s* always sharp; *r* always trilled; *f* initial, *f; f* medial and final, *v; v* initial, *v; v* medial, *w; i*=English *y; th* initial, elsewhere, *dh*. There was a sign for *ng*, *hr*, *hn*, *hl*, like our *when* =hwen. Double consonants kept separate, and, after the discontinuance of nasal vowels, *dhr=ndhr; br=mbr; llr=ldr;* short vowel and *d=nd;* short vowel and *k* or *g=nk*, *ng*. In short the rule seems to be pronunciation clear, and rather slow; words and phrases cut as short as possible. Accent on first, if not, on root syllable. Quantity entirely by accent. At the end of the 13th c. ensued a change of pronunciation and spelling; and in the 16th c. a whole new series of changes in pronunciation, making the language like modern English—spelled, not pronounced. The MS. was the Lombard: that is, Anglo-Saxon or Irish, gradually changing, as with us, to Gothic. Modification of words had been accomplished in vowels by (*a*) *umlaut*, as in Gothic, and more in Saxon; (*b*) *reflection* by *i=y*, and *v=w* from the next syllable. As in English these changes had been taken advantage of to show difference of meaning, as falla, to fall, and fella, to fell. This also liquidizes—the commonest sign of the language—all broad vowels, when a corresponding termination has dropped. Fjarr, Eng. far, fjodhr, feather, etc. Changes in consonants are (*a*) *assimilation: np=pp*, happ (*hap.*); *nk=kk*-drikka (drink) *nt* or *ndt=tt*, vettr (winter); *nth=nn*—sannr (south); *lth=ll*—gull (gold); *rd* (*zd*)=*dd*—odd (point); *rn* (*zn*)=*nn*—rann (house) ran (sack); *nnr* (*dnr*)=*dhr*—fidhr (finds). (*b*) *Inflection*: *lr* (*lz*)=*ll*.—gamall (old); *nr* (*nz*)=*nn*—steinn (stone); *sr=ss*—iss (ice): *dhd* =*dd*—faedda (fed); *dht=lt* gótt (good). Alone of all Indo-European languages (since the formation of case), it suffixes the article, and that to both noun and article, and the independent adjective has best preserved the old forms. There is a strong declension of nouns, *r* taking the place of *s* and a weak declension, but German *n* dropped already. Comparison much as in English: illr (ill); verri (worse); verstr (worst). Numerals between Saxon and Danish. Pronouns: *ek* (I), thú (thou); hann (he), hon (she); vit (we two) thit (ye two); vér (we); thér (ye); their (they, men); thaer (they, women); thau (they, things). Verbs have two tenses, present and past, other by help verbs, as in English: and four moods—indicative, subjunctive, imperative, and infinitive. Strong and weak verbs as in German and Saxon, and, as in English, the strong are becoming weak. It has a peculiar form. The reflexive is formed by adding *z* to verb, or *sék* as a pronoun. Adverbs vary between English and German. Adjectives are formed for the most part with terminals not found in English. The grammar is particularly noticeable for what may be called close contact in the parts of a sentence, for impersonal and reciprocal verbs, for prepositional verbs, with a different meaning as in English and Russian, and the use of the dative of near definition. Of the earliest works Heims-Kringla still shows traces of poetic arrangement; but the language can only be judged by Kormak's saga, rather antiquated, and by Laxdaela, and Niala, the latter heroic in brevity and pithiness. The poetry, though formed on some extinct model, which must have served for all the early memory, rhymes of the Indo-European races, having the additional advantage of alliteration, and later of rhyme, seldom it rises to the height of Eirik Blood-Axe's death-song; and for the most part it is a mere convolution of stereotyped allusions and forced alliterations.

NORWEGIUM, a metallic element discovered by Teleff Dahll, in copper-nickel from Kragaro in Skjaergaarden, Norway. The color of the pure metal is white, with a slight brownish cast. When freshly polished it has a perfect metallic luster, but after a time becomes covered with a thin film of oxide. In hardness it resembles copper. One oxide N_yO, has so far been obtained. A brown sulphide is formed by treatment with sulphureted hydrogen, which redissolves in ammonium sulphide. Solution in hydrochloric acid, green; in nitric acid, blue; and in sulphuric, colorless.

NORWICH, a city of Connecticut, at the head of navigation of the Thames river, 13 m. n. of New London, and 38 s.e. of Hartford. The chief portion of the city lies on an eminence that rises between the Yantic and Shetucket rivers, which here unite to form the Thames. There are numerous manufactories of cotton, wool, paper, etc., which are supplied with water-power by falls of 50 ft. on the Yantic river. Norwich contains county buildings, 7 banks, 1 daily and 3 weekly papers, 16 churches, 40 public and 5 private schools, and a free academy. Norwich was settled in 1569, when 9 sq.m. were bought for £70 of Uncas, an Indian chief, whose grave is in the city. Pop. '70, 16,653.

NORWICH (*ante*), semi-capital of New London co., Conn.; situated on the Norwich and Worcester, and the New London Northern railroads, connected with New York by a line of large steamboats; pop., '80, 21,141. The town is built upon a series of terraced hills, and in the valleys of the Shetucket and Yantic, which here uniting form the Thames. There are a court house, 10 banks, 2 daily and 2 weekly papers, a public library, high school, and the Norwich Free academy, which has a very high reputation as a training school for college. Water power is obtained from the tributaries of the Thames and the variety of manufactures is very great, including cotton and woolen goods, paper, machinery, rubber articles, pistols, envelopes, iron, and machinery The increase in population since 1870 has been about 6,000; indicating that the business prospects of the town are excellent. Main street is the principal business thoroughfare, and Broadway and Washington streets are among the most beautiful of those occupied by private residences. There are many fine public buildings, handsome dwellings, and ornamental grounds; and the city is noted for picturesque beauty.

NORWICH, a t. the co. seat of Chenango co., Yew York, pleasantly situated on the Chenango river and canal, and the Delaware, Lackawanna, and Western, and New-York and Oswego Midland railroads; 90 m. w. of Albany; pop. 70, 4,279. It has a stone court-house, an academy, 8 churches, 2 banks, and 2 weekly newspapers. Among the articles manufactured are carriages, pianos, hammers, leather, and machinery.

NORWICH, a city of England, capital of the co. of Norfolk, and a co. in itself, on the Wensum, immediately above its confluence with the Yare, 20 m. w. of Yarmouth, and 98 m. n.n.e. of London. It covers an area about 5 m. in circumference, is skirted on its n, and e. sides by the river, and on the w. and s. it was formerly surrounded by walls, the last vestiges of which have been recently removed in order to make room for the extension of the city. The market-place (600 ft. long by 840 ft. wide) and its vicinity contain many large shops and good houses. The castle, finely situated on an elevation near the center of the town, originally covered, with its works, an area of about 23 acres. The bridge (150 ft. long) over the ditch has one of the largest and most perfect Anglo-Norman arches remaining. The massive quadrangular Norman keep is now used as a prison. The cathedral, almost wholly Norman in plan, was founded in 1094 by bishop Herbert Losinga. It is 411 ft. long, 191 ft. broad at the transepts, and is surmounted by a spire 315 ft. high. Near the cathedral are a number of ancient and interesting structures now more or less in ruins, among which may be mentioned St. Ethelbert's and the Erpingham gate, the former in decorated English, the latter in late perpendicular, and both valuable and rich specimens of their styles. Besides a large number of dissenting chapels and other places of worship, there are about 40 churches, of which St. Peter's, Mancroft, a handsome cruciform edifice of the 15th c., with a remarkably fine peal of 12 bells; St. Andrew's, St. Clement's, St. George's, St. Giles, St. Michael's, and others, are worthy of mention. The Free Grammar school, with an endowment of about £200 a year, was founded by Edward the VI., and the other educational establishments are numerous and various in character. The public library contains 20,000 volumes, and the library of the Norwich literary institution, 15,000 volumes. Norwich is the seat of extensive and flourishing manufactures, the chief of which are bandanas, bombazines, shawls, crapes, gauzes, damasks, camlets, and muslins; shoemaking is extensively carried on, yarn and silk mills are in operation, and employ many hands. Iron-founding, dyeing, malting, etc., and agricultural implement-making, are also carried on. The trade, which is facilitated by a canal and river system of communication with the sea, is chiefly in agricultural produce and coal. Norwich is the see of a bishop, and returns two members to parliament. Pop. of municipal and parliamentary borough in '71, 80,386

About 3 m. s. of Norwich is Castor St. Edmunds, which, prior to the Roman era, was called Caister, and under the Romans received the name of *Venta Icenorum*. Norwich occupies a place in history from the time of the earlier Danish invasions, had its origin in the castle erected as a stronghold by the East Anglian kings, and resorted to as a place of safety by the inhabitants of *Venta Icenorum*, who gave it the name of North-wic, or northern station or town, on account, of its relative postion with respect to their own town. The bishopric of the East Angles was removed hither in 1094. About 4,000 Flemings settled at Norwich in the reign of Elizabeth, and greatly increased the prosperity of the town by the branches of manufacture which they introduced.

NORWICH CRAG, or MAMMALIFEROUS CRAG, a series of highly fossiliferous beds of sand, loam, and gravel, of Pleistocene age, occurring at several places within a few miles of Norwich, where they are popularly named "crag." They contain a mixture of marine and fresh-water mollusca, with ichthyolites and bones of mammalia. They are evidently estuary beds, the most common shells being the very species now abundant in such situations around the coasts of Britain; but with them are associated a few extinct species. The beds rest on the white chalk, the surface of which is frequently perforated by *pholas crispata*, the shell still remaining at the bottom of the cavity. The mammalian bones belong to species of elephant, horse, pig, deer, and field-mouse. With them are occasionally found the bones of *mastodon angustidens* and some mollusca, which belong to the red crag. Their occurrence here is believed to have arisen from their having been washed out of the Red into this, the Norwick crag.

NORWOOD, UPPER and LOWER, are two villages in Surrey, England, with a station on the London and Croydon railway, 6 m. s. of London. The public pleasure-ground, called the Beulah Spa, is prettily laid out around a mineral spring. The villages are worthy of mention, however, chiefly on account of their schools, among which are a district school for the pauper children of Lambeth parish, and a very large and important educational establishment for the pauper children of London. The district parish of Norwood had, in 1871, a population of 12,586.

NOSE, AND THE SENSE OF SMELL. The nose is not only the organ of smell, but is likewise a part of the apparatus of respiration and voice. Considered anatomically, it may be divided into an external part—the projecting portion, to which the term *nose* is popularly restricted; and an internal part, consisting of two chief cavities, or *nasal fossæ*, separated from one another by a vertical septum, and subdivided by spongy or turbinated bones projecting from the outer wall into three passages or *meatuses*, with which various cells or *sinuses* in the ethmoid, sphenoid, frontal, and superior maxillary bones communicate by narrow apertures.

The external portion of this organ may be described as a triangular pyramid which projects from the center of the face, immediately above the upper lip. Its summit or root is connected with the forehead by means of a narrow bridge, formed on either side by the nasal bone and the nasal process of the superior maxillary bone. Its lower part presents two horizontal elliptical openings, the *nostrils*, which overhang the mouth, and are separated from one another by a vertical septum. The margins of the nostrils are usually provided with a number of stiff hairs (*vibrissæ*), which project across the openings, and serve to arrest the passage of foreign substances, such as dust, small insects, etc., which might otherwise be drawn up with current of air intended for respiration. The skeleton, or framework of the nose, is partly composed of the bones forming the top and sides of the bridge and partly of cartilages, there being on either side an upper lateral and a lower lateral cartilage, to the latter of which are attached three or four small cartilaginous plates, termed sesamoid cartilages; there is also the cartilage of the septum which separates the nostrils, and in association posteriorly with the perpendicular plate of the ethmoid, and with the vomer, forms a complete partition between the right and left nasal fossæ. It is the lower lateral, termed by some writers the alar cartilage, which by its flexibility and curved shape forms the dilatable chamber just within the nostril. The nasal cartilages are capable of being slightly moved, and the nostrils of being dilated or contracted by various small muscles, which it is unnecessary to describe. The integument of the nose is studded with the openings of sebaceous follicles, which are extremely large and abundant in this region. The oleaginous secretion of these follicles often becomes of a dark color near the surface; and hence the spotted appearance which the tip and lower parts of the sides, or *alæ*, of the nose frequently present. On firmly compressing or pinching the skin of these parts, the inspissated secretion is forced out of the follicles in the form of minute white worms with black heads.

The *nasal fossæ*, which constitute the internal part of the nose, are lofty, and of considerable depth. They open in front by the nostrils, and behind they terminate by a vertical slit on either side in the upper part of the pharynx, above the soft palate, and and near the orifices of the eustachian tubes, which proceed to the tympanic cavity of the ear.

The mucuous membrane lining the nose and its cavities is called *pituitary* [Lat. *pituita*, slime, rheum), from the nature of its secretion; or *Schneiderian*, from Schneider, the first anatomist who showed that the secretion proceeded from the mucous membrane, and not, as was previously imagined, from the brain; it is continuous with the skin of the face at the nostrils, with the mucous covering of the eye through the lachrymal duct (see EYE), and with that of the pharynx and middle ear posteriorly. This membrane varies in its structure in different parts of the organ. On the septum and spongy bones bounding the direct passage from the nostrils to the throat, the lining membrane is comparatively thick, partly in consequence of a multitude of glands being disseminated beneath it, and opening upon it, but chiefly, perhaps, from the presence of ample and capacious submucous plexuses of both arteries and veins, of which the latter are by far the more large and tortuous. These plexuses, lying as they do in a region exposed more than any other to external cooling influences, appear to be designed to promote the warmth of the part, and to elevate the temperature of the air on its passage to the lungs. They also serve to explain the tendency to hemorrhage from the nose in cases of general or local plethora. In the vicinity of the nostrils, the mucous membrane exhibits papillæ and a scaly epithelium, like the corresponding parts of the skin, In the sinuses, and in all the lower region of the nose, the epithelium is of extreme delicacy, being of the columnar variety, and clothed with cilia. In the upper third of the nose—which, as the proper seat of the sense of smell, may be termed the *olfactory region*—the epithelium ceases to be ciliated, assumes a more or less rich sienna-brown tint, and increases remarkably in thickness, so that it forms an opaque soft pulp upon the surface. It is composed of an aggregation of nucleated particles, of nearly uniform appearance throughout, except that the lowest ones are of a darker color than the rest, from their containing a brown pigment in their interior. Dr. Todd and Mr. Bowman remark, in their *Physiological Anatomy*, from which we have condensed the above account of the nasal mucous membrane, that the olfactory region abounds in glands, apparently identical with sweat glands, which dip down in the recesses of the submucous tissue among the ramifications of the olfactory nerve.

The nerves of the nose are the first pair or olfactory which are specially connected with the sense of smell, branches of the fifth pair which confer ordinary sensibililty on its skin and mucous membrane, and motor filaments, from the facial nerves to the nasal muscles. The olfactory nerve on each side is connected with the inferior surface of the brain (q.v.) by an external, a middle, and an internal root, which unite and form a flat band (or, more correctly, a prism), which, on reaching the cribriform plate of the ethmoid bone, expands into an oblong mass of grayish-white-substance, the *olfactory bulb*. From the lower surface of this bulb are given off the *olfactory filaments*, fifteen or twenty in number, which pass through the cribriform foramina, and are distributed to the mucous membrane of the olfactory region. These filaments differ essentially from the ordinary cerebral nerves. They contain no white substance of Schwann, are not divisible into elementary fibulæ, and resemble the gelatinous fibers in being nucleated, and of a finely granular texture. The branches of the fifth pair (or trifacial) given to the nose are the nasal nerve (derived from the ophthalmic division), which supplies the skin and mucous membrane in the vicinity of the nostrils, and the naso-palatine nerve (derived from Meckel's ganglion, which is connected with the superior maxillary division), which supplies the mucous membrane on the spongy bones and on the septum. The peculiar sensation that precedes sneezing is an affection of the nasal nerve, and the flow of tears that accompanies a severe fit of sneezing is explained by the common source of this and the lachrymal nerve; while the common sensibility of the nose, generally, is due to the branches of this and of the naso-palatine nerve.

The nature of odorous emanations is so little known, that it is impossible to give a definite account of the mode in which they produce sensory impressions. From the fact that most odorous substances are volatile, and *vice versâ*, it may be presumed that they consist of particles of extreme minuteness dissolved in the air; yet the most delicate experiments have failed to discover any loss of weight in musk, and other strongly odorous substances, after they have been freely evolving their effluvia for several years. But whatever may be the nature of the odorous matter, it is necessary that it should be transmitted by a respiratory current through the nostrils to the true olfactory region, whose membrane must be in a healthy condition. If it is too dry, or if there is an inordinate excretion of fluid from its surface (both of which conditions occur in catarrh or cold in the head), smell is impaired or lost, in consequence of the necessary penetration of the stimulating odor to the nervous filaments being prevented.

The acuteness of the sense of smell is far greater in many of the lower animals (dogs, for example) than in man, and they employ it in guiding them to their food, in warning them of approaching danger, and for other purposes. To civilized men its utility is comparatively small; but it is occasionally much increased when other senses are deficient. In the well-known case of James Mitchell, who was deaf and blind from his birth, it was the principal means of distinguishing persons, and enabled him at once to perceive the approach of a stranger. Amongst many savage tribes the sense is almost as acute as in many of the lower mammals. For example, the Peruvian Indians are able, according to Humboldt, to distinguish, in the middle of the night, whether an approaching stranger is a European, American Indian, or Negro,

Although all poisonous gases are not odorous, and all bad odors may not be positively deleterious to health, there can be no doubt that one of the principal objects for which the sense of smell is given to us is to enable us to detect atmospheric impurities, many of which are of a most noxious character, and give rise to the most serious forms of fever.

NOSE-RING. See RING.

NOSING, the projecting edge of a molding, such as the bead or bottle used on the edge of steps, to which the term is most frequently applied.

NOSOL'OGY (Gr. *nŏsŏs*, disease) is that branch of the science of medicine which treats of the distribution and arrangement of diseases into classes, orders, etc. Many systems of nosology have at different times been adopted; some of which have been based upon the nature of the ascertained causes of diseases; others on the pathological states or conditions which attend diseases; others on the differences between structural and functional diseases, etc. It is hard to say which is the most perfect method; but that of Dr. Farr, one of the most distinguished living medical statists, is adopted by the registrar-general in the reports on the mortality of London and England, and is becoming more generally adopted than any other. It has the advantage over the antiquated but once popular system of Cullen (1792) of meeting the requirements of modern science, and (by illustrating great questions connected with public health) of showing those causes that are injurious or fatal to life, and of thus contributing to the removals of those evils (bad drainage, imperfect ventilation, etc.) which tend to shorten human existence.

We append Dr. Farr's system of nosology, which is arranged in four primary classes, each of which includes various orders:

CLASS I. ZYMOTIC DISEASES (Gr. *zymē*, a ferment).—Diseases that are either epidemic, endemic, or contagious, and that are induced by some specific body, or by want of food or by its bad quality. In this class there are four orders—viz., Order I. *Miasmatic Diseases* (Gr. *miasma*, a stain), such as small-pox, measles, scarlet-fever, diptheria, typhus and typhoid fevers, cholera, ague, etc. Order II. *Enthetic Diseases* (Gr. *enthĕtos*, put in or implanted), such as syphilis, gonorrhœa, glanders, hydrophobia, malignant pustule, etc. Order III. *Dietic Diseases* (Gr. *diaita*, way of life or diet), such as famine, fever, scurvy, purpura, rickets, bronchocele, delirium tremens, etc. Order IV. *Parasitic Diseases*, such as scabies (or itch), and worm disorders from animal parasites and ringworm, scald-head, etc., from vegetable parasites or fungi.

Class II. Constitutional Diseases.—Diseases affecting several organs, in which new morbid products are often deposited; sometimes hereditary. This class contains two orders. Order I. *Diathetic Diseases* (Gr. *diathĕsis*, condition or constitutional), including gout, anæmia, cancer, melanosis, lupus, etc. Order II. *Tubercular Diseases*, such as scrofula, phthisis, mesenteric, tubercular meningitis, etc.

Class III. Local Diseases.—Diseases in which the functions of particular organs or systems are disturbed or obliterated with or without inflammation; sometimes hereditary. This class includes eight orders. Order I. *Brain Diseases* (or more correctly, *Diseases of the Nervous System*), such as apoplexy, paralysis, epilepsy, chorea, hysteria, mania, etc. Order II. *Heart Diseases* (or more correctly, *Diseases of the Circulatory System*), such as pericarditis, endocarditis, aneurism, angina pectoris, atheroma, phlebitis, varicose, etc. Order III. *Lung Diseases* (or more correctly, *Diseases of the Respiratory System*), such as bronchitis, pneumonia, pleurisy, asthma, empyema, laryngitis, etc. Order IV. *Bowel Diseases* (or more correctly, *Diseases of the Digestive System*), such as stomatitis, gastritis, enteritis, peritonitis, jaundice, etc. Order V. *Kidney Diseases*, such as Bright's disease, nephritis, ischuria, diabetes, stone, gravel, etc. Order VI. *Genetic Diseases* (or *Diseases of the Generative System*), such as hydrocele, ovarian dropsy, etc. Order VII. *Bone and Muscle Diseases*, such as caries, necrosis, exostosis, synovitis, muscular atrophy, etc. Ordor VIII. *Skin Diseases*, such as urticaria, eczema, herpes, impetigo, acne, lichen, prurigo, etc.

Class IV. Developmental Diseases.—Special diseases, the incidental result of the formative, reproductive, and nutritive processes. It contains four orders. Order I. *Developmental Diseases of Children*, such as malformations, idiocy, teething, etc. Order II. *Developmental Diseases of Women*, such as amenorrhea, childbirth, change of life, etc. Order III. *Developmental Diseases of Old People*, such as old age, and its concomitant affections. Order IV. *Diseases of Nutrition*, such as atrophy, debility, etc.

NOSSI-BE, NOSSI-BARIN, VARIOU-BE or HELLEVILLE, an island on the n.w. coast of Madagascar, at the mouth of the bay of Pasoandava, and separated from the main land by a narrow channel. It is about 74 sq.m. in extent; its coast-land is very much indented; and its surface much diversified. The highest hill is 1700 ft. in height, and is clothed to the summit with magniffcent trees; but much of the island has a bare aspect, the forest having been cut down in order to the cultivation of rice. The soil is very fertile, and rice, maize, manioc, bananas, etc., are produced far beyond the wants of the inhabitants. The soil is volcanic, and there are several old craters filled with water. Nossi-Bé has been in the hands of the French since 1840, and is regarded by them as an important possession, on account of an old claim which they suppose themselves to have to Madagascar. There is on this island a small town called Helleville, with a harbor well sheltered from the north and east winds. There is good anchorage also at several other parts of the coast. The population of the island is about 6,000.

NOSSIIBRAHIM, or Sainte Marie, an island on the e. coast of Madagascar, and separated from it by a strait of about 5 m. in width. It is about 40 m. in length from n.n.e to s.s.w., but only a few miles in breadth. It is one of the much-prized possessions of the French on the coast of Madagascar, has been in their lands since 1750, and is their chief place of commerce on that coast. The soil is generally arid, and the climate moist and unhealthy. Rain is of extreme frequency. The population of the island is about 5,000. It contains a small town called Saint Louis—a seaport, and fortified. All the French possessions on the coast of Madagascar were placed by an imperial decree of 1851 under one government, that of the Comoro Isle (q.v.).

NOS'TOC, a genus of plants of the natural order *Algæ*, suborder *Confervaceæ*, found upon moist ground, rocks near streams, etc., and consisting of a somewhat gelatinous hollow tumid frond, filled with simple filaments resembling strings of beads. *N. commune* is frequent in Britain, springing up suddenly on gravel-walks and pasture-grounds after rain. It is a trembling gelatinous mass, often called Star Jelly, and vulgarity regarded, owing to the suddenness with which it makes it appearance, as having fallen from the skies, and as possessed of important medicinal virtues. *N. edule* is employed in China as an article of food.

NOSTRADAMUS, a celebrated astrologer of the 16th c., b. Dec. 14, 1503, at St. Remi, in Provence. His proper name was Michel Notre-Dame, and he was of Jewish descent. He studied first at the collége d'Avignon, where he exhibited remarkable scientific powers, and subsequently attended the celebrated school of medicine at Montpellier. Here he first acquired distinction during an epidemic that desolated the s. of France, by his humane attention to those stricken by the pestilence. After taking his degree, he acted for some time as professor, but was induced by his friend J. C. Scaliger to settle in Agen as a medical practitioner. After traveling for some time, he finally settled at Salon, a little town situated in the environs of Aix, about 1544. Already he must have been reckoned a man of note, for in the following year, when an epidemic was raging at Lyon, he was solemnly invited thither by the civic authorities, and is said to have rendered immense services. He first fell upon his prophetic vein about the year 1547, but in what light he himself regarded his pretensions, it is now impossible to say. At any rate, he commenced to write his famous predictions (*Prophéties*) which first appeared at Lyon in 1555. The predictions were in rhymed quatrains, divided into centuries, of which there were seven; the 2d ed., published in 1558, contained ten. Astrology was then the fashion, and these quatrains, expressed generally in obscure and enigmatical terms, had a great success. Some, indeed, regarded the author as a quack, but the great majority as a genuine seer or predicter of the future. He was, consequently, much sought after by all sorts of people, high and low. Catherine de'Médicis invited him to visit her at Blois, to draw the horoscope of her sons, and on his departure loaded him with presents. The duke and duchess of Savoy went to Salon expressly to see him; and when Charles IV. became king, he appointed Nostradamus his physician-in-ordinary (1564). He died at Salon, July 2, 1566. Nostradamus's predictions have been the subject of an immense amount of illustrative and controversial literature. He also wrote an Almanac, which served as the model of all subsequent ones, containing predictions about the weather.—See Jaubert's *Vie de M. Nostradamus, Apologie et Historie* (Amst. 1656); Astrue's *Mémoires pour servir à l'Histoire de la Faculté de Montpellier* (Paris, 1767); *Apologie pour les Grands Hommes Soupçonnés de Magie* (Paris, 1825); and E. Bareste's *Nostradamus* (Paris, 1842).

NOSTRILS, Diseases of the. Acute inflammation of the nasal mucous membrane is a very common and well-known affection, which has been already described under the title of catarrh (q.v.), or cold in the head; while the chronic form of inflammation is described in the article Ozœna. Hemorrhage from the nostrils, or *Epistaxis* (Gr. a drop ping), is by far the commonest form of bleeding from a mucous membrane. It may be produced (1) by direct injury, as by a blow on the nose, or a scratch in the interior of the nostrils; or (2) it may be an *active* hemorrhage, in which case it is often preceded by a feeling of tension and heat in the nostrils, pain in the forehead, giddiness, buzzing in the ears, and flushing of the face (these symptoms are, however, seldom all present in the same case, and not unfrequently the flow of blood is preceded by no apparent disorder); or (3) it may be of a *passive* character, and may be due either to a morbid condition of the blood, as in malignant scarlatina, typhoid and typhus fevers, scurvy, purpura, etc., or to obstruction of the circulation by disease of the liver and heart.

If the hemorrhage occur in a flushed plethoric subject, and is obviously of an active character, it may be regarded as a salutary effort of nature, and may be left alone till it ceases spontaneously; but if it continues so long as materially to weaken the patient, or if it be of the passive character, or if it arise from injury, then means should be taken to stop it with as little delay as possible. The patient should be placed in the sitting posture at an open window, with the head erect or slightly inclined backwards, and amongst the simpler means to be first tried, are compression of the nostrils by the fingers, the application of a key or other piece of cold metal to the back of the neck, and the occasional immersion of the face or whole head in cold water, especially if accompanied by a drawing-up of the water into the nostrils; or Dr. Negrier's plan of causing the patient, in a standing position, suddenly to raise his arms straight upwards, and to retain them for a short time in this position—a remedy which he states to have always succeeded, even in very bad cases, when other means had failed. Should these means fail, recourse must be had to astringent injections (for example, twenty grains of alum dissolved in an ounce of water) thrown up the nostrils by a syringe, or to astringent powders (as finely-powdered galls, kino, matico, alum, etc.), blown up the nostrils by means of a quill or other tube, or snuffed up by the patient. As a final resource, direct compression must be applied, Abernethy never failed in stopping the bleeding by winding a piece of moistened lint around a probe, so as to form a cylindrical plug, passing this along the floor of the nose for its entire length, then carefully withdrawing the probe, and allowing the lint to remain for three or four days. Cases occasionally occur in which it is necessary also to plug the posterior orifices of the nostrils by an operation, into the details of which it is not necessary to enter.

Polypus, which is an old term employed to signify any sort of pedunculated tumor firmly adhering (literally, "by many feet") to a mucous surface, is of common occurrence in the nostrils; its most usual seat of attachment being one of the turbinated bones. The ordinary kind is of the consistence of jelly, yellowish, streaked with blood-vessels, and of a pear-shaped form. The patient has a constant feeling of fullness in the nostril (as if he had a cold in the head); he cannot effectually blow his nose; and his voice is sometimes rendered more or less thick and indistinct. If he force his breath strongly through the affected nostril, and at the same time compress the other, and close the mouth, the polypus may generally be brought in view. The best treatment is to seize the neck or pedicle with the forceps, and twist it off. The consequent hemorrhage may be readily checked by the means already described.

Foreign bodies are often inserted into the nostrils by children, and become impacted. They may usually be extracted by a small scoop or a bent probe. If they cannot be removed by these means, they must be pushed back into the throat through the posterior nares.

Children are occasionally born with imperforated nostrils. This congenital malformation may, however, usually be remedied by surgical assistance.

NOTABLES, the name formerly given in France to persons of distinction and political importance. As the states general were inconvenient to the despotism of the monarchy, the kings of the House of Valois adopted the expedient of calling in their stead *Assemblies of the Notables*, the time of calling them and the composition of them being entirely dependent on the pleasure of the crown, by which also their whole proceedings were guided, so that they generally consented at once to whatever was proposed to them. They showed a particular readiness in granting subsidies, to which they themselves, as belonging to the privileged classes, were not to contribute. An Assembly of Notables, convened in Paris by Richelieu in 1626, and presided over by Gaston, brother of Louis VIII., consisted of only 85 members. For more than a century and a half even this poor acknowledgment of any other mind or will in the nation than that of the sovereign ceased to be made; but when the state of the finances brought the monarchy into difficulties and perils, Louis XVI., at the instigation of the minister Calonne, had recourse again to an Assembly of Notables, which met Feb. 22, 1787, and was dissolved May 25. It consisted of 137 members, among whom were 7 princes of the blood, 9 dukes and peers, 8 marshals, 11 archbishops, 22 nobles, 8 councilors of state, 4 masters of requests, 37 judges, 12 deputies of the Pays d'Etats, the civil lieutenant, and 25 persons belonging to the magistracy of different cities of the kingdom. Calonne's representations of the state of the finances induced the Notables to adopt many reforms in the matter of taxation; but no sooner was the assembly dissolved, than many of them joined the parliaments in opposition to resolutions adverse to their private interests, so that the king was compelled to determine upon assembling the states general. Necker, who had meanwhile been placed at the head of affairs, assembled the Notables again, Nov. 6, 1788, to consult them concerning the form in which the states general should be convened. The Notables declared against every innovation, and so compelled the court to half measures which helped to prepare the way for the Revolution. The parliament of the new principality of Bulgaria is spoken of as the Assembly of the Notables.

NOTACANTHIDÆ, a family of acantheropterous, fishes allied to the mackerels: indeed, they were formerly placed in the same family, (*scomberidæ*). They have also been placed by recent writers in a separate order (*opisthomi*). They have an elongated eel-like form, and the caudal extremity is surrounded, as in eels, by a continuous fin. The body is covered with very small cycloid scales, and the lateral line is well marked. They are five species, 1. *notocanthus nasus*, Greenland, 2. *n. Bonapartii*, 3. *n. Mediterraneus*, 4. *n. Sexspinus*, Australia, 5. *n. rissoanus*, Mediterranean.

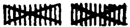
NOTARY-PUBLIC is an officer of the law, whose chief function is to act as a witness of any solemn or formal act, and to give a certificate of the same; which certificate, if duly authenticated, is accepted all the world over as good evidence of the act done in his presence, and attested by him. The services of a Notary are chiefly available where his evidence is to be used in a foreign country. Solicitors are sometimes notaries-public, but in England there are fewer notaries, comparatively, than in Scotland, where notarial acts and certificates are more largely used.

NOTARY PURLIC (*ante*), an officer introduced from the civil law, and known in ancient Rome as *tabellio forensis;* in England, appointed by the archbishop of Canterbury. In this country, the duties of a notary vary in the different states, being a matter of statutory regulation. But in general his duties are to protect bills of exchange, to take oaths and affirmations, to attest legal instruments, and to certify to documents. Notaries in England have always exercised the right of administering oaths, and that right has been confirmed by the statute, 5 and 6 Will. IV. In this country, the right can be exercised only where express statutory authorization is given, unless the oath administered is to be used in proceedings in the U. S. courts, or courts outside of the state. The act of Congress, Sept. 16, 1850, gave notaries equal authority with justices of the peace to administer oaths and take acknowledgments. A notary is liable for damages resulting from negligence in the discharge of his duties. He cannot as a rule delegate his notarial authority to another person. But a protest of a foreign bill of exchange by a notary's clerk, if such delegation be shown to be a commercial custom in the place fixed for the payment of the bill is valid. Where a notary is employed by an agent, and is guilty of negligence, the question arises whether the principal has a remedy against the agent, or against the notary: thus where an agent entrusted with the collection of a bill of exchange has it protested by a notary, whose negligence discharges the drawer and indorsers. Some courts hold that the principal may recover against the notary only when the latter's act is purely notarial, i.e. one that can be performed only by a notary: other courts hold that the remedy of the principal is against the notary only, whether the act be notarial or not.

NOTATION, the method of representing numbers and quantities by marks or signs. The representation of numbers is known as "arithmetical," and that of quantities as "symbolical" notation.

1. Arithmetical Notation.—The invention of arithmetical notation must have been coeval with the earliest use of writing, whether hieroglyphic or otherwise, and must have come into use about the time when it was felt that a mound, pile of stones, or huge misshapen pillar, was insufficient as a record of great events, and required to be supplemented by some means which would suffice to hand down to posterity the requisite

information. The most natural method undoubtedly was to signify "unity" by one stroke, "two" by two strokes, "three" by three strokes, etc.; and, as far as we know, this was the method adopted by most of those nations who invented systems of notation for themselves. It is shown on the earliest Latin and Greek records, and is the basis of the Roman Chinese, and other systems. We have thus a convenient division of the different notational systems into the *natural* and *artificial* groups, the latter including the systems of those nations who adopted distinct and separate symbols for at least each of the nine digits. The Roman and Chinese systems are the most important of the former, and the Hebrew, later Greek, and "decimal" systems of the latter group.

Roman System.—The system adopted by the Romans was most probably borrowed at first from the Greeks, and was distinguished equally by its simplicity and its cumbrousness. The following seems to be the most probable theory of its development. A simple series of strokes was the basis of the system; but the labor of writing and reading large numbers in this way, would soon suggest methods of abbreviation. The first and most natural step was the division of the strokes into parcels of tens, thus,  a plan which produced great facility in the reading of numbers. The next step was to discard these parcels of ten strokes each, retaining only the two cross strokes, thus, ╳, as the symbol for 10. Continuing the same method as larger numbers came to be used, they invented a second new symbol for 100, thus, ⊏ (which was at first probably the canceling stroke for ten ╳'s in the same way as ╳ was originally the canceling stroke for ten units); and for the sake of facility in writing, subsequently employed the letter C, which resembled it, in its place. The circumstance that C was the initial letter of the word *centum*, "a hundred," was doubtless an additional reason for its substitution in place of the original symbol for 100. An extension of the same process produced M, the symbol for 1000, which was also written ⩚, ᗰ, and very frequently CIↃ. This symbol was probably suggested by the circumstance that M was the initial letter of the Latin word *mille* signifying a thousand. The early Roman system went no higher. But though the invention of these three symbols had greatly facilitated the labor of writing down and reading off numbers, further improvements were urgently required. The plan of "bisection of symbols" was now adopted; ╳ was divided into two parts, and either half, V or Λ, used as the symbol for 5; ⊏ was similarly divided, Γ or L standing for 50; and ⋉, CI, or IↃ, was obtained in the same manner, and made the representative of 500. The resemblance of these three new symbols to the letters V, L, and D, caused the substitution of the latter as the numerical symbols for 5, 50, and 500. A final improvement was the substitution of IV for 4 (in place of IIII), IX for 9 (in place of VIIII), XC for 90 (instead of LXXXX), and similarly XL for 40, CD for 400, CM for 900, etc; the smaller number, when in front, being always understood as subtractive from the larger one after it. This last improvement is the sole departure from the purely additional mode of expressing numbers; and if the symbols for 4, 9, 90, etc., be considered as single symbols, which they practically are, the deviation may be looked upon as merely one of form. In later times, the Roman notation was extended by a multiplication of the symbol for 1000, thus CCIↃↃ represented 10,000; CCCIↃↃↃ represented 100,000, etc.; and the bisection of these symbols gave them IↃↃ and IↃↃↃ as representative of 5,000 and 50,000 respectively. This, in all probability, is the mode according to which the Roman system of notation was constructed. To found a system of arithmetic upon this notation, would have been well-nigh impossible; and so little inventive were the Romans, that the attempt seems never to have been made. They performed what few calculations they required by the aid of the *abacus* (q.v.).

Chinese System.—This system presents a strong resemblance to the former, but is, in facility of expression, much superior to it. Like the Roman, it retains the primitive symbols for the first three digits, and like it also expresses the last four by prefixing a new symbol to the symbols for the first four, and the analogy is continued up to "twenty." From this point onwards, the Chinese system departs from the "additive" principle, as 20, 30, etc., are represented not as in the Roman system by a repetition of the symbol for 10, but by affixing to the symbol for 10, on its left side, the symbols for 2, 3, etc., as multiples. The same method is adopted with the numbers 200, 300, etc.; and should the number contain units, they are annexed on the right-hand side. For small numbers up to 20, the Roman notation is more expeditious, on account of the greater simplicity of its characters; but for very large numbers, the Chinese is scarcely more cumbrous than our own. Some numbers which are expressed by the Chinese with 14 characters, require more than 100 symbols when expressed in the Roman notation.

Previous to the intercourse of the western European nations with China, their notation was much more cumbrous than it is at present; but the changes since made have affected merely the form of the characters, without altering the principle of the system.

Artificial Systems.—The first of these, in point of date, is the Hebrew; but as the knowledge we possess of it is very meager, and as its principle was adopted by the Greeks in the construction of their improved system, it will be sufficient to describe the latter.

Greek System.—The Greeks at first used a method similar to the Romans, though at the same time they appear to have employed the letters of the alphabet to denote the first 24 numbers. Such a cumbrous system was naturally distasteful to so fastidious a race, and they hit upon the happy expedient of dividing their alphabet into three portions—

using the first to symbolize the 9 digits, the second the 9 tens, and the third the 9 hundreds. But as they possessed only 24 letters, they had to use three additional symbols; their list of symbols of notation then stood as follows:

Units.		Tens.		Hundreds.	
α represents	1	ι represents	10	ρ represents	100
β	2	κ	20	σ	200
γ	3	λ	30	τ	300
δ	4	μ	40	υ	400
ε	5	ν	50	φ	500
ϛ (introduced)	6	ξ	60	χ	600
ζ	7	ο	70	ψ	700
η	8	π	80	ω	800
θ or ϑ	9	Ϟ or ϟ (introduced)	90	ϡ, Λ, Ͳ (introduced)	900

By these symbols, only numbers under 1000 could be expresied, but by putting a mark, called *iota*, under any symbol, its value was increased a thousand-fold, thus $\underset{,}{\alpha} = 1000$, $\underset{,}{\kappa} = 20,000$; or by subscribing the letter M, the value of a symbol was raised ten thousand-fold, thus, $\underset{M}{\eta} = 80,000$. For these two marks, single and double dots placed over the symbols were afterwards substituted. This improvement enabled them to express with facility all numbers as high as 9,990,000, a range amply sufficient for all ordinary purposes. Further improvements were made upon this system by Apollonius, who also by making 10,000 the root of the system, and thus dividing the symbols into tetrads, greatly simplified the expression of very large numbers. Both Apollonius and Archimedes had to a certain extent discovered and employed the principle of giving to symbols values depending on their position and multiplicative of their real value, but this principle was applied to tetrads or periods of four figures only, and the multitude of symbols seems to have stood in the way of further improvement. Had Apollonius, who was the chief improver of the system, discarded all but the first nine symbols, and applied the same principle to the single symbols which he applied to the "tetrad" groups, he would have anticipated the decimal notation.

The Greek arithmetic, founded upon such a system of notation, was necessarily lengthy and complicated in its operations, each number in the multiplicand forming with each number in the multiplier a separate product (not as in our system, where one product blends with another by the process of "carrying"), though by arranging these products in separate columns, according as they amounted to units, tens, hundreds, etc., the process was somewhat simplified. But when fractions formed part of the multiplier and multiplicand, the Greek arithmetic became almost unmanageable, till the invention of sexagesimals (q.v.) by Ptolemy superseded it. After Ptolemy's death, all improvement was arrested.

Decimal System.—The decimal system, which was introduced into Europe from the east (see NUMERALS), was first employed by the Spaniards, and was from them transmitted to the French and Germans, through whom its use was extended over Europe. The modern arithmetic was not practiced in England until about the middle of the 16th c., and for a long time after its introduction was taught only in the universities. The decimal system, possessing only 9 symbols—viz., 1, 2, 3, 4, 5, 6, 7, 8, 9 (called the nine digits)—adopts the principle of giving to each symbol or "figure" two values, one the absolute value, and the other a value depending upon its position. The numbers from "one" to "nine" inclusive, are expressed by the nine digits; ten is expressed by writing a cipher or zero after 1 (10), thus throwing it into the second place, and giving it a positional value ten times its absolute value. From the principle that a figure thus moved one place to the left is held to be increased in value ten times, this method of notation is called *decimal* notation (Lat. *decem*, ten), and *ten* is said to be the "radix" of the system. The numbers from "eleven" to "nineteen" inclusive are expressed by taking the symbol 10 and putting the digits from "one" to "nine" inclusive in place of the zero—e.g., twelve is written 12, 1 *in position* signifying ten units, and 2 two additional units. On the same principle, twenty is expressed by putting 2 in the second position (20), and so on to 99. To express a hundred, 1 is put in the third place (100), thus making its value ten times what it is in the second place, or ten times ten units; two hundred is similarly expressed by 200, etc.; and should a number of tens and units amounting to less than a hundred exist in the number, the symbols expressing them are substituted for the two zeros. This process can be similarly continued without limit.

There is another way of looking at this notation, which is perhaps simpler and clearer. In such a number, e.g., as 333, instead of attributing different values to the figure 3 in the different positions, we may consider it as symbolizing the same number throughout, namely, *three;* but three *what?* In the first place, it signifies three ones or units (e.g., three single pounds or sovereigns); in the second place, it still signifies three, but now it is three "tens" or decades (three parcels of ten sovereigns each); and in the third place, it still signifies three, but now three hundreds (three parcels of a hundred each). It is from this point of view that the first place to the right is called the *place of units*, or the *units' place;* the second, the *place of tens*, and so on. When such a number as 6473 is analyzed on this principle, it is seen to mean 6×1000 (6 times 1000) $+ 4 \times 100 + 7 \times 10 + 3 \times 1$;

and 6004 becomes $6 \times 1000 + 4 \times 1$. In this latter instance the peculiar importance of the figure 0 is seen (see NOTHING). Following out the method, the general formula for all numbers is $a \times 10^n + b \times 10^{n-1} + c \times 10^{n-2} + \ldots + m \times 10^3 + n \times 10^2 p \times 10 + q$, where $a, b, c, \ldots\ m, n, p, q$, stand for any of the nine digits or zero.

The special advantages of such a system are manifold. It enables us to express small numbers with the greatest ease, and as the smaller numbers are those most commonly used, this is a great point in favor of the system. It also gives to computation a unity which could never under any circumstances have existed in the systems of notation above described, and the most ordinary, and at the same time effective illustration of this is the process of "carrying" in multiplication, whereby one product is blended with another, and much time and trouble in the subsequent addition is saved. This simplification, however, is chiefly due to the introduction of the symbol 0, which, supplying the place of an absent digit, preserves to those figures on the left of it their true positional value. Another advantage of this system is the ease with which computations involving fractions are performed (see FRACTIONS, DECIMAL). The use of the number 10 as *radix*, is universal in all systems of notation; but it has been often doubted, and in some respects with good reason, whether it is the number best fitted for this position, and many have proposed to substitute 12 for it. This question will be referred to under SCALES OF NOTATION.

2. SYMBOLICAL NOTATION, the general designation of those symbols which are used by mathematicians to express indefinite quantities. The symbols are generally taken from the English, Roman, and Greek alphabets, and are apportioned as follows: Algebraic quantities are expressed by the English alphabet; those which are known, by the earlier letters $a, b, c, \ldots$, and those which are unknown, by the later ones, $u, v, w, x, y, \ldots$ In trigonometry, the letters $a, b, c, \ldots$ denote measures of length, and A, B, C, ... are used to express angles. In mechanics and astronomy the Greek letters are generally used to express angles. When different sets of quantities are similarly related among themselves, the sets are, for convenience, expressed by the same letters; and to prevent confusion, each set has a peculiar mark attached to each symbol, thus, $a, b, c, \ldots$ denote one class; and $a', b', c', \ldots$ another class; $a'', b'', c'', \ldots$ a third class; and so on; or, $a_1, b_1, c_1, \ldots\ a_2, b_2, c_2, \ldots$, etc.

NOTE, in music, a character which by the degree it occupies on the staff represents a sound, and by its form the period of time or duration of that sound. The notes commonly in use in modern music are the semibreve, 𝅝; minim, 𝅗𝅥; crotchet, 𝅘𝅥; quaver, 𝅘𝅥𝅮; semiquaver, 𝅘𝅥𝅯; demisemiquaver, 𝅘𝅥𝅰; and semi-demiquaver, 𝅘𝅥𝅱. Taking the semibreve as unity, the minim is $\frac{1}{2}$ its duration, the crotchet $\frac{1}{4}$, the quaver $\frac{1}{8}$, the semiquaver $\frac{1}{16}$, the demisemiquaver $\frac{1}{32}$, and the semi-demiquaver $\frac{1}{64}$. Notes of greater length than the semibreve were formerly in use—viz., the breve, twice the duration of the semibreve; the long, four times; and the large, eight times the semibreve. Of these, the breve, ▭ or 𝅝, is still sometimes met with in ecclesiastical music.—The term note is often used as synonymous with musical sound.

NOTES OF THE CHURCH are marks by which a true church is distinguished. Practically, as to human judgment, they vary according to the different theories held concerning the constitution of a church. Irenæus refers to the unity of the church's doctrines, and her succession of bishops from the apostles: Tertullian appeals to the antiquity of the church derived from the apostles, and its priority to all heretical communities. The creed of Constantinople defines the church as "One, holy, Catholic, and apostolic." Augustine discerned the church chiefly in the consent of nations, authority founded on miracles, sanctity of morals, succession of bishops from Peter, and even in the name "Catholic church." Jerome specifies the duration of the church from the apostles and the Christian name. Luther insists on the uncorrupted preaching of the gospel, administration of baptism, and of the eucharist, and the keys. Calvin regards chiefly truth of doctrine and right administration of the sacraments. Bellarmine multiplies the marks into catholicity, antiquity, duration, amplitude, episcopal succession, apostolical agreement, unity, sanctity, and efficacy of doctrine, holiness of life, miracles, prophecy, admission of adversaries, unhappy end of enemies, and temporal felicity. Bishop Taylor mentions antiquity, duration, succession of bishops, union of members among themselves and with Christ, and sanctity of doctrine.

NOT GUILTY is the form of verdict in a criminal prosecution, and also in some civil actions, when the jury find in favor of the defendant or accused party. The verdict is conclusive, and the accused cannot, in criminal cases, be tried a second time.

NOTHING, in mathematical language, denotes the total absence of quantity or number, as when equals are subtracted from equals, but it is often employed (see LIMIT) to indicate the limit to which a constantly decreasing position quantity approaches. The absence of number or quantity could be equally well signified by the absence of any symbol whatever, but the presence of "0" shows that in its place some number or quantity might, and under other circumstances would, exist.

In physics, the symbol "0" is generally denominated *zero*, and has a different meaning. Like the former, it is the starting-point from which magnitude is reckoned; but while the starting-point in the former case was absolute, in this case it is conventional, and by no means denotes the absence of all quantity or magnitude. Thus the zero-point of the thermometer must not be interpreted to signify that when the mercury has fallen to this point atmospheric heat has totally vanished, but must be understood as a mere conventional starting-point for graduation, chosen for convenience, and not even necessarily representing any fixed natural degree of temperature.

NOTHOPIDÆ, a family of non-venomous snakes, established by prof. Cope, for a peculiar genuine type made known by himself. It is related to the boas and pythons, but is of small size. The only known species is found in central America.

NOTICE, in law, denotes existing knowledge of some fact or the act of giving information. In the former sense it may be actual or constructive, actual when the party is directly informed of the fact by word of mouth or by letter; constructive, when the party is legally presumed to have information on grounds of public policy or has been "put upon inquiry" by his knowledge of facts intimately connected with the particular fact in dispute. Thus a party to a suit has constructive notice of a newspaper advertisement published by order of the court, and a person accepting a conveyance which refers to some other deed is bound to consult the latter or take the consequence of his negligence. But when the liability of a party to do or not to do a certain act is conditional on the occurrence of a fact which is best known to the other party, the plaintiff must prove that actual notice was given to the defendant. Averment of notice is the allegation in a pleading that notice has been properly given, and there must be such averment when the matter lies more properly in the knowledge of the plaintiff than the defendant; in common law pleading omission of averment is fatal on demurrer or a claim of judgment by default. Notice to plead before a fixed time must be given in writing before judgment can be signed for non-pleading, and, in general, notice must always be given to the opposing party of any new step in procedure. Secondary evidence cannot be offered of the contents of a written instrument until notice has been given to the opposing party to produce it on trial, except where the party in possession holds the paper by fraud or when he is supposed from the nature of the case to have constructive notice. The notice to produce should be in writing, should clearly describe what is required, and must be served on the party or his attorney a reasonable time before trial. Notice of dishonor must be given to an indorser of a promissory note and to the drawer or indorser of a bill of exchange, when demand for payment or acceptance has been made and refused by the maker of the note or by the drawer or acceptor of the bill of exchange, in order to change such indorser or drawer. Only persons who after dishonor are at once liable to an action on the negotiable paper need be immediately notified. Notice of dishonor must be immediate, must clearly describe the bill or note and the nature of the non-acceptance, may be oral though usually in writing, and may be served personally or by mail. Notice to quit from a landlord to a tenant is necessary only when the tenant holds at will or for an uncertain time. Notice in this case should be served by the owner or agent upon the tenant in person or some member of his family and at his usual place of abode. A time must be fixed at the end of which the premises must be vacated. This at common law was 6 months, but in this country is governed by statutory enactment, being, in many cases, 8 months. When there are joint tenants or tenants in common the notice must be addressed to all but may be served on one. After the specified time has passed any act of the landlord which recognizes the continuance of the tenant in possession of the premises is a waiver of the notice. The acceptance of rent, if not explained, would constitute such an act. Where A. assigns to C. a debt due from B., B. is not affected by the assignment without due notice. Thus where a mortgage has been assigned and subsequently the mortgageor not having notice, has made payments to the original mortgagee, such payments are good, and the assignee cannot recover from him. In a contract notice may be expressly required or may be implied from the nature of the agreement. If the act to be done is indefinite—as to pay for certain kinds of lumber as much as could be gotten by the vendor from any one else—it is obvious that notice is necessarily implied; not so, however, when the act is definite or specific, as to pay a fixed sum on the occurrence of a certain event. When a *bona fide* purchaser for consideration has had notice of the existence of fraud or unfairness in the contract by which his vendor obtained the possession of the article bought, that contract cannot be sustained on the ground that he is an innocent third party.

NOTICE TO QUIT, is the formal notice given by a landlord to a tenant, or by a tenant to a landlord, that the tenant ought or intends to quit at a future day named. See LANDLORD AND TENANT.

NOTIDANIDÆ, a family of sharks distinguished by the number of branchial apertures, which are six or seven. There are three genera, *hexanchus*, *heptanchus*, and *notorhynchus*, the latter inhabiting south African, and western North American shores, and the first two the Atlantic ocean and Mediterranean. The members of the family are small, none of them much exceeding 8 ft. in length.

NO'TO, a t. of Sicily, in the province of Syracuse, and 16 m., s.w. of the city of that name, 8 m. from the sea. It is of the highest antiquity, was a place of great strength under the Saracens, and held out against the invading northmen longer than any other town of Sicily. It is a very handsome town, contains rich churches, beautiful palaces, and broad and straight streets. Its academy has a library attached, and a collection of antiquities. A good trade is carried on in corn, wine, oil, and the other produce of the vicinity. Pop. 14,619. Noto was destroyed by an earthquake in 1693, and rebuilt about 4¼ m. from its former site.

NOTOCHORD, the *chorda dorsalis* (q.v. in DEVELOPMENT OF THE EMBRYO, *ante*).

NOTOPTERUS, a genus of fish belonging to the herring family (*clupeidæ*).

NOTOTHENIIDÆ, a family of acanthopterous fishes, inhabiting southern seas, and representing the cod-fishes of the northern. The greatest number of species belong to the typical genus *notothenia*, and they are abundant on the southern shores of South America.

NOTOR'NIS, a genus of birds of the family *Rallidæ*, nearly allied to the coots, although in some of its characters it resembles the ostrich family. One living species only is known. *Notornis Mantellii*, a native of New Zealand. It is particularly interesting, because the genus was originally established and the species characterized by Owen, from remains found along with those of *dinornis* and other large birds of the ostrich family, called moas by the New Zealanders. The bird was, however, ascertained in 1850 still to exist. It inhabits some of the most unfrequented parts of the middle island. It is larger than the other coots, but small in comparison with the true moas. The flesh is said to be delicious. It seems to be a bird likely soon to become extinct unless preserved by human care, and of which the domestication would be easy and desirable.

NOT PROVEN is a form of verdict used in Scotland in criminal prosecutions when the jury think there is some foundation for the charge, but the evidence is not strong enough against the prisoner to warrant a verdict of guilty. In such a case, a verdict of "Not Proven" is substantially a verdict of acquittal. The prisoner cannot be tried afterward, even though new and conclusive evidence come to light after the verdict.

NOTRE DAME, i.e., *Our Lady;* the old French appellation of the virgin Mary, and therefore the name of a number of churches dedicated to the virgin Mary in different parts of France, and particularly of the great cathedral of Paris.

NOTRE DAME, CATHEDRAL OF (*ante*), the most celebrated church among the many of that name in France. It is the cathedral of Paris; and by its great age, the majesty of its proportions, and the stirring scenes of seven centuries of history, of which it has been either theater or witness, it is one of the remarkable historical monuments of the world. History does not reach to the time when its site was not the site of a sanctuary. In the reign of the Roman emperor Tiberius altars for pagan worship existed on the east end of the island in the Seine, where Notre Dame now stands. The remains of a temple of Jupiter and Cernnunos, and the image of a horned god, were found on the spot about 375, when a church was erected on the same site; supposed to have been the first Christian church erected in north France. In the 6th c. there were two churches there, St. Etienne and Ste. Marie. Childebert rebuilt the latter about the year 520 in a Roman style, considered very grand. The first glass window now known of in France was placed in it. Fragments of mosaic and precious marbles supposed to be from the floor and columns of this church were discovered in excavations in 1847, and are now in the *Musée de Cluny*. This church was pillaged and partly destroyed by the Normans in 857, but it was repaired by "Anscheric, 50th bishop of Paris." In 1140 the abbé of St. Denis put in a glass window of great beauty. It was then called the *Eglise neuve*, to distinguish it from the *St. Etienne*, called *le vieux*. In the 12th c. both were falling into ruins, though they had for centuries been used for the great religious ceremonies and royal pageants of France. About 1160 bishop Maurice de Sully resolved to replace both old churches with a single edifice worthy the capital of the kingdom, and in 1163 the foundation of the present majestic pile was begun, and its corner stone placed by the hands of pope Alexander III., then a refugee in France. The work was pushed rapidly, so that, in 1182, on Wednesday of the pentecost, the great altar was consecrated by a legate of the pope. In 1185 Heraclius, patriarch of Jerusalem, came to Paris to officiate with the bishop in the dedication of the choir. Henry II., king of England, was interred before its high altar in Aug., 1186. Notwithstanding the completion for service of the body of the church in the 12th c., the grandest part of the cathedral—its western front with the two towers—was only begun by bishop Pierre de Nemours, A.D., 1208. It rose at the rate of about one story in the life of one generation of men. The portal of the south transept façade was built still later, as shown by an inscription of the mason who began work upon it in 1257, in the reign of St. Louis. Other, and some of the most beautiful, portions were completed during the succeeding centuries. The environing chapels in the rear of the transepts were not a part of the original design, and were added in the last part of the 13th c., about which time, also, the towers of the west front were complete. In 1699 Louis XIII. was seized with the ambition to place in the cathedral an altar piece in the renaissance style, then just coming into vogue; and removed the original altar to give place to it. Other alterations were made by Soufflot, an eminent architect, in 1771–78. During the revolution, the masses of saintly carvings upon the church were threatened with destruction by the infidel mobs, and were saved at one time by a ruse of Chaumette, who assured the people that information concerning the planetary system was embodied in some of the image sculpture. But the statues of the old kings of France, which were upon the gallery of the grand façade, did not escape the vandalism. In 1793 the cathedral became, by law of the revolutionists, the Temple of Reason. In 1845 the first thoroughly intelligent and comprehensive work for the restoration of Notre Dame was entered upon, under the control of architects Lassus and Viollet-Leduc. Their work was prosecuted uninterruptedly for ten years, so that by 1855 the marvelous blending of majesty of proportion with grace of detail and spirit in design in its west façade were exhibited in bolder relief than ever before in all its history. During the reign of Louis Napoleon the vast structure. on every side, from foundation to pinnacles, was cleaned and repaired; and for the first time in the seven hundred years of its growth could be seen with all its varied constructions as one completed whole. The year 1882 will be the 700th anniversary of its consecration. From 1182 to the present its lofty nave, its altars, and its chapels, have been the scenes of all the most important ceremonies of church and state in France. The baptism of princes, their marriages, coronations, royal funerals, the reception of the great dignitaries of the church, Te Deums for victories, and the surging masses of Parisian revolutions for seven hundred years have made historic procession under its lofty vaults. The architecture embraces nearly every noble feature peculiar to the era that witnessed the growth and culmination of Gothic architecture, and for simple majesty of expression its façade has no superior. The extreme length of the cathedral is 430 ft.; width at transept, 170 ft.; and area covered by it, 64,108 sq.ft.; height of towers, 223 ft.

NOTRE DAME, SCHOOL SISTERS OF. See SCHOOL SISTERS.

NOTRE DAME, UNIVERSITY OF, at Notre Dame, St. Joseph co., Ind., a Roman Catholic institution, founded in 1842. It has no endowment. It has 14 buildings, good laboratories and apparatus, with cabinets and collections of art, and a library of 30,000 volumes. It embraces a preparatory school, a commercial and classical department, and schools of art, science, medicine, and law. The students are trained in gymnastic and military exercises. Jan. 1, 1880, it had 20 professors, 19 other instructors, 350 students, and 400 alumni. President, the very rev. William Corby, c.s.c.

NOTT, ELIPHALET, D.D., LL.D., 1773–1866; b. Ashford, Conn. He enjoyed the careful training of an excellent mother, and at the age of four had read the Bible through. At the age of 16 he taught school, and at 18 took charge of the Plainfield academy, pursuing at the same time his classical and mathematical studies with the rev. Dr. Benedict. From Plainfield he went to Brown university, remaining a year, but did not graduate. though in 1795 he received the degree of master of arts. He then studied theology with his brother in Franklin; was licensed by the New London Congregational association in 1796; was missionary and school teacher at Cherry Valley, N. Y., in 1795–97; pastor of the Presbyterian church in Albany in 1798–1804. In 1804 he was elected president of Union college, Schenectady. He found the college in a low condition, "without funds, buildings, or library, and in debt," and its friends greatly disheartened; but he was successful in raising funds, and providing for its pressing needs. His remarkable executive abilities, and his power as a disciplinarian, were soon apparent, and young men came to the college from every state in the union. During his presidency of over 62 years, upwards of 4,000 students graduated. Dr. Nott was one of the most distinguished of American educators, and is spoken of as "one of the historical monuments of this country." In 1811 he was the moderator of the general assembly of the Presbyterian church. He published *Counsels to Young Men on the Formation of Character and the Principles which lead to Success and Happiness in Life; Lectures on Temperance*, presenting a convincing argument for the disuse of intoxicating liquors. He published also several baccalaureate and other sermons and addresses. His most remarkable discourse was on the occasion of the fatal duel between Hamilton and Burr. The sermon made a profound impression upon the public mind, and gave him wide fame as a pulpit orator. Dr. Nott had great mechanical talent, and in the "Digest of Patents" are found 80 in his name granted for the application of heat to steam-engines, the economical use of fuel, etc. Dr. Crook, of the *Methodist*, says of him: "Perhaps no American educator, no American preacher, who has seen the dawning of 1865, has had so unique a history—few, probably, so effective a career. Intellectually, he was a remarkable man—many-sided, and superior on most sides. His mechanical genius is well-known, and one of the most famous iron-manufactories (the 'Novelty Works') originated in one of his inventions, which, by its economical peculiarities, was first known as a 'novelty.' He was a great financier, and enriched himself and Union college by his masterly skill and enterprise." Dr. Nott was not only an able theologian, but probably the most finished pulpit orator in the country. "Strong, serene, dignified, beautiful in language, clear in thought." "His most striking characteristic as a preacher was his perfect grace of manner, toned by a perfect graciousness of religious feeling." His memory was extraordinary, contributing greatly to his eloquence, as he was able to go at once from the writing of his discourse to the pulpit without his manuscript, and deliver it without any effort at recollection. He had indomitable force of character, and his mental power was controlled by Christian principles

NOTT, JOSIAH CLARK, 1804–73; b. S. C.; educated at the college of South Carolina, and in medicine at the medical school in Philadelphia, where he was for a time demonstrator in anatomy. In 1829 he returned to South Carolina, and entered upon the practice of his profession. In 1835 he went to Europe, where he spent a year in the study of medicine and the natural sciences. On his return he settled in Mobile, where he continued to practice medicine, founding, in 1858, a medical college, which became a department of the university of Alabama. He gave much attention to ethnology; and published, besides many contributions to medical periodicals, *Two Lectures on the Connection between the Biblical and Physical History of Man*, 1849; *The Physical History of the Jewish Race*, 1850; *Types of Mankind*, 1854; and *Indigenous Races of the Earth*, 1857. He wrote the last two works in conjunction with George R. Gliddon. He attempted, in his books on ethnology, to disprove the unity of the human race His theories were regarded, in general, as more original than profound.

NOTT, Samuel, d.d., 1754–1852; b. Conn.; brother of Dr. Eliphalet, the president of Union college; graduated at Yale college in 1780; ordained pastor of the Congregational church in Franklin, Conn., Mar. 18, 1782, where he remained until his death, performing his pastoral duties up to his 94th year, and dying from the effects of a fall. He published several occasional *Sermons*.

NOTT, Samuel, 1788–1869; b. Conn.; son of the rev. Samuel of Franklin, Conn., and nephew of the rev. Dr. Eliphalet, president of Union college. He graduated at Union college, 1808; Andover seminary, 1810; ordained (Congregationalist), 1812, with Newell, Judson, Hall, and Rice; and embarked with Hall, Feb. 24, as a missionary of the American board to India. After some delays from the East India company, they reached Bombay, where they began a mission. His health failing, he returned to his native land in 1815. His return caused great disaffection among the friends of missions in America, as in that day it was thought inconsistent for one who had undertaken to labor for Christ among the heathen to return home on any account. He was engaged in preaching, teaching, and writing for the press until 1850. Among his published works was *Slavery and the Remedy*. He died in Hartford, Conn.

NOTTINGHAM, an inland co. of England, between Lincolnshire on the e., and Yorkshire and Derbyshire on the west. Area, 526,176 acres; pop. '71, 319,758. It is 50 m. in length from n. to s., and 20 m. in average breadth. The meridian of 1° w. falls along the middle of the county, and may be said to divide it into two nearly equal portions, of which the eastern, comprising the vale of the Trent, is level, and the western is occupied by hills of no great elevation. In the s. of the co. are the wolds, consisting of upland moors and pasture-lands, broken up by many fertile hollows. In the w. are the remains of the royal forest of Sherwood, famous as the chief haunt of Robin Hood. The principal rivers are the Trent, and its tributaries, the Erewash, Mann, and Idle. The Nottingham and Grantham canal, in the s., connects the Trent with the Witham, and these two rivers are also connected by the Fosse Dyke canal, which, running n.w. from the city of Lincoln, joins the Trent on the n.e. boundary of the county. By the rivers, canals, and North Midland, Sheffield and Lincoln, and Great Northern railways, there is direct communication in every direction. The climate, especially in the e., is remarkably dry. The soil is various; and, with regard to productiveness, the land is not above mediocrity. The usual crops are raised; there are many hop-plantations, and much land is laid out in market-gardens. Extensive tracts have been planted recently. Four members of parliament are returned for the county

NOTTINGHAM, a municipal and parliamentary borough of England, capital of the county of the same name, and a county in itself, on the Leen at its junction with the Trent, 180 m. n.n.w. of London. It is built principally on the slope and at the foot of a rocky eminence, and, in an architectural sense, it has, within recent years, been much improved. The market-place is 5½ acres in extent, and is surrounded by lofty buildings. The Trent, which passes about a mile s. of the town, and is here about 200 ft. wide, is crossed by railway bridges, and by an ancient bridge of 19 arches. The exchange, the town and county halls, the house of correction, St. Mary's church, the Roman Catholic chapel, and the new free grammar-school, erected in 1868, are edifices worthy of special mention. The free grammar school, with an income from endowment of about £1000 a year, was founded in 1518. A free library was opened in April, 1868. There are numerous hospitals for the poor and infirm. Of the manufactures, which are various and important, the principal are bobbinnet and lace, and cotton and silk hosiery. Cotton, silk, and flax mills, bleaching-works, and wire, iron, and brass works are in operation. Nottingham sends two members to parliament. Pop. '71, 86,621.

The original castle of Nottingham was built by William the conqueror. Ruined during the civil wars, it was rebuilt after the Restoration, and burnt during the reform bill riots. In 1878 it was restored and transformed into a museum and picture gallery.

NOTTINGHAM, Heneage Finch, d.c.l., first Earl of, 1621–82; b. England; son of the recorder of London, and connected with the family of the earls of Winchelsea. He was educated at Westminster school, and at Oxford, and on quitting the university, began to read law in the inner temple, London. In 1660, upon the restoration of Charles II., he became solicitor-general, and represented the crown in the prosecution of the regicides, of the proceedings against whom he published an account, in 1660. In 1661 he was returned to parliament for the university of Oxford, and made a baronet. He was conspicuous in the impeachment of the earl of Clarendon in 1667, and three years later was made attorney-general. In 1676 he was made keeper of the great seal, in succession to lord Shaftesbury, and in 1675 he became lord chancellor. In 1680 he sat as lord steward, on the trial of viscount Stafford, against whom he delivered judgment with great eloquence. He was made earl of Nottingham in 1681. He published a number of legal arguments and a volume of *Reports of Cases decreed in the High Court of Chancery*.

NOTTOWAY, a co. in s.e. Virginia, bounded on the s. by the Nottoway river; on the Atlantic, Mississippi, and Richmond and Danville railroads; 800 sq.m.; pop. '80, 11,156—11,110 of American birth, 8,148 colored. The surface is uneven, and portions are heavily wooded. The principal productions are tobacco, of which great quantities are raised, Indian corn, wheat, and oats. Co. seat, Nottoway Court House.

NOTTOWAYS, a tribe of Indians, who lived about the Nottoway river, in Virginia. They belonged to the Huron Iroquois family and spoke a language of that family, of which they formed one of the most southern divisions. They gave themselves the name of Cherohakah. They were at one time a powerful tribe, and survived the famous Powhatans. In 1700 they still numbered 130 warriors, and in 1729 they had increased to 200. They were then living in cabins surrounded by a palisade, on the w. bank of the Nottoway. Attempts were made by governor Spottswood and others to civilize and educate them, but unsuccessfully. In 1781 they had a reservation of 27,000 acres, of which only a very small part was under cultivation; and, according to Jefferson, not a single male of the tribe was then left alive.

NOU'KHA, a town of Asiatic Russia, in Trans-Caucasia, is built on the southern slope of the Caucasus mountains, 80 m. s.w. of Derbend, in lat. 41° 12' n., long. 47° 13' e. Pop. (1867) 23,871, consisting of native Tartars belonging to the Mohammedan creed, of Armenians, and a few Russians, chiefly officials. Breeding the silk-worm is the staple branch of industry. The native breed of silk-worms is somewhat coarse, and is now being supplanted by the Italian breed.

NOUN (Lat. *nomen*, a name), in grammar, is the term applied to that class of words that "name" or designate the persons and things spoken about. In a wide sense, such words as *rich*, *tall*, are nouns, as well as *John*, *man*, *tree;* for they are names applicable to all objects possessing these attributes. But as words like John, man, tree, suffice of themselves to mark out or designate an object or a definite class of objects, while words expressive of a single attribute, like *rich*, *tall*, can be used only in conjunction with such a word as *man* or *tree*, the one class are called adjective nouns, or simply adjectives (q.v.), while the others are called substantive nouns, or simply substantives or nouns. Nouns or names, in this narrower sense, may be divided into classes in a variety of ways, according to the ground we take for our division. One of the distinctions commonly made by grammarians is into proper nouns and common nouns. A proper noun is usually defined to be "the name of any individual person, or place," as *John*, *London;* while a common noun is applicable to every individual of a class of objects, as *prince*, *city*. But this definition fails to point out the real difference; for there are several Londons, and there are more Johns than princes; other things also have proper names, besides persons and places, as ships (the *Minotaur*), and bells (Big Ben). Providence again, although applicable to only one being in the universe, is not a proper noun. Wherein, then, lies the difference? In order to answer this question, we must advert to an important distinction made by logicians with regard to the import of names. A word is said to *denote* all the objects to which it is applicable as a name; thus, the word *man* is a name for all the objects known individually, as James, John, Adam, Cæsar, etc., and therefore denotes the whole human race; but while thus denoting or naming them, it also implies something concerning them; in the language of logic, it *connotes* that they possess certain attributes, namely (1) a certain corporeal form, knows as the human form; (2) animal life; (3) rationality. All this, at least, is included in the *meaning* or connotation of the word "man." Now, if we consider any noun of the class called common, we find that while it denotes, or names, or points out a certain object, or class of objects, it also conveys or implies some qualities or facts concerning them; in other words, all such names are *connotative*, or have a meaning. Not so with proper nouns. To say that a man is called John Butler, informs us of no quality he possesses, or of any fact except that such is his name. The name itself conveys no meaning; it is *nonconnotative*. And this is what really constitutes a proper name; it is affixed to an object, not to convey any fact concerning it, but merely to enable you to speak about it. Proper names, indeed, are often given at first on account of the object possessing certain attributes; but once given, they do not continue to connote those attributes. The first John Baker was probably so called because he exercised the trade of baking; but his ceasing to bake would not have made him lose the name; and his descendants were called Baker, regardless of their occupation.

Proper names are thus *meaningless marks*, to distinguish one individual from another; and the A, B, C, etc., which a geometrician affixes to the several angles of a figure, are as much proper names as Tom, Lawrie, etc., applied to the individual bells of a chime. The proper contrast then, to a proper noun is not a common noun—meaning by that a name common to a class of objects—but a significant noun.

Of significant nouns, by far the greater number are general or class names; that is, they can be applied to any individual of a class of objects, implying that all these individuals have certain attributes in common—as *quadruped, book.* The quadruped spoken of may perhaps be a *horse*, and here we have another class-name, applicable to the same object, but of less generality than "quadruped." *Animal*, again, is more general than quadruped; being applicable to a far wider class. But it is important to observe, that as the number of objects that the terms are applied to, or denote, increases, the number of attributes they imply—in other words, the amount of their meaning—diminishes. To call an object an "animal," merely implies that it is organized and is alive (with that kind of life called animal life); to call it a "quadruped," implies all this and a number of attributes in addition; and to call it a "horse" implies a still further addition.

It is to this class of words that the term common nouns is properly applicable; and the contrast to them is not proper nouns, but what might be called singular nouns, such as "God," "Providence," universe."

Collective names are such as *regiment, fleet, senate, shoal.* They form a subdivision of class names or common nouns; for *regiment* is applicable to all collections of men organized in a particular way.

Names of materials are such as *iron, water, sugar, wheat.* These two classes appear in many cases to merge into each other. In both the objects named consist of an aggregation; but in collective names the parts forming the collection are thought of as individual objects; as the *soldiers* of a regiment, the *fishes* composing a shoal. Substances, again, like iron, gold, water, are not made up of *definite* individual parts (at least to our senses); and in such as wheat, sand, the name of the individual visible part (*grain of wheat, grain of sand*) is derived from the name of the mass, showing that the idea of the individual is swallowed up in that of the mass.

A convenient term for names of materials or substances is that used by German grammarians—stuff-nouns. Sometimes the same word is used as a stuff-noun, and also as a class-noun. Thus: "The cow eats *grass*" (stuff-noun); "the botanist studies the *grasses* and has found a new *grass*" (class-noun); "they had *fish* (stuff-noun) for dinner, and consumed four large *fishes*" (class-noun).

Names of materials are not, like collective nouns, a subdivision of common nouns; they belong to the contrasted class of singular nouns; and, when the substance is simple or invariable in composition, cannot be used in the plural; as *gold, water, beef.*

Abstract Nouns.—In the expression "hard steel," or "the steel is hard," the word *hard* implies a certain quality or attribute as belonging to the steel. This quality has no existence apart from steel or some other substance; but I can withdraw (*abstract*) my thoughts from the steel in other respects, and think of this quality as if it had an independent existence. The name of this imaginary existence or abstraction is *hardness.* All words expressive of the qualities, actions, or states of objects, have abstract nouns corresponding to them; as *brave—bravery; strike—stroke; well—health.* In opposition to abstract nouns, all others are *concrete* nouns—that is, the attributes implied in them are considered as embodied in (*concrete*, Lat. growing together) the actual existences named.

NOUREDDIN-MAHMOUD, Malek-al-Adel, one of the most illustrious men of his time, and the scourge of the Christians who had settled in Syria and Palestine, was born at Damascus, Feb. 21, 1116. His father, Omad-ed-din Zengui, originally governor of Mosul and Diarbekir on behalf of the Seljuk sultans, had established his independence, and extended his authority over Northern Syria, including Hems, Edessa, Hamah, and Aleppo. Noureddin-Mahmoud succeeded him in 1145, and the better to carry out his ambitious designs, changed the seat of government from Mosul to Aleppo. Count Joscelin of Edessa, thinking the accession of a young and inexperienced sovereign afforded him a favorable opportunity of regaining his territories, made an inroad at the head of a large force, but was signally discomfited under the walls of Edessa, his army, with the exception of 10,000 men, being completely annihilated. The report of Noureddin-Mahmoud's success being conveyed to western Europe, gave rise to the second crusade. The crusaders were, however, foiled by Noureddin-Mahmoud before Damascus, and being defeated in a number of partial conflicts, abandoned their enterprise in despair. Noureddin-Mahmoud next conquered Tripolis and Antioch, the prince of the latter territory being defeated and slain in a bloody conflict near Rugia (June 29, 1149), and before 1151 all the Christian strongholds in Syria were in his possession. He next cast his eyes on Egypt, which was in a state of almost complete anarchy under the feeble sway of the now effeminate Fatimites, and, as a preliminary step, he took possession of Damascus (which till this time had been ruled by an independent Seljuk prince) in 1156; but a terrible earthquake which at this time devastated Syria, leveling large portions of Antioch, Tripolis, Hamah, Hems, and other towns, put a stop to his scheme for the present, and compelled him to devote all his energies to the removal of the traces of this destructive visitation. An illness which prostrated him in 1159, enabled the Christians to recover some of their lost territories, and Noureddin-Mahmoud, in attempting their re-subjugation was totally defeated near the lake of Gennesaret by Baldwin III., king of Jerusalem; but undismayed by this reverse, he resumed the offensive, defeated the Christian princes of Tripolis and Antioch, making prisoners of both, and again invaded Palestine. Meanwhile, he had obtained the sanction of the caliph of Bagdad to his projects concerning Egypt, and the true believers flocking to his standard from all quarters, a large army was soon raised, which, under his lieut. Shirkoh, speedily overran Egypt. Shirkoh dying soon after, was succeeded by his nephew, the celebrated Salah-ed-din (q.v.), who completed the conquest of the country. Noureddin-Mahmoud, becoming jealous of his able young lieut., was preparing to march into Egypt in person, when he died at Damascus, May 15, 1174. Noureddin-Mahmoud is one of the great heroes of Moslem history. Brought up among warriors who were sworn to shed their blood for the cause of the prophet, he retained in his exalted station all the austere simplicity of the first caliphs. He was not, like the majority of his co-religionists, a mere conqueror, but zealously promoted the cultivation of the sciences, arts, and literature, and established a strict administration of justice throughout his extensive dominions. He was revered by his subjects, both Moslem and Christian, for his moderation and clemency, and even his most bitter enemies among the Christian princes extolled his chivalrous heroism and good faith. He possessed in an eminent degree the faculty of impressing his own fiery zeal for the supremacy of Islam upon his subjects, and their descendants at the present day have faithfully preserved both his name and principles.

NOVAC'ULITE, a silicious slate derived from the argillaceous schists of the paleozoic period. Novaculite is the compact and homogeneous portions of the rock. See HONES, *ante*.

NOVALIS. See HARDENBERG.

NOVARA, a province in n.w. Italy, adjoining Switzerland; bounded on the e. by the lake Maggiore and the Ticino, on the s. by the Po, and on the w. by Turin; drained by the Toce and its affluents; 2,526 sq.m.; pop. '72, 624,985. The surface is mountainous, intersected by the Alps, among whose ridges are fertile valleys. The principal productions are silk, hemp, grain, and rice. Capital, Novara.

NOVARA, a t. of Northern Italy, and capital of the province of the same name, is situated in a fertile district about 60 m. n.e. of Turin. Pop. '71, 24,185. It commands fine Alpine views from its ancient dismantled fortifications, and contains several notable churches, especially the cathedral, with its fine frescos and sculptures, and grand high-altar. On March 23, 1849, Novara was the scene of a grand battle between the Sardinian forces and an Austrian army commanded by Radetzky, which resulted in the complete defeat of the Italians, and ultimately led to the abdication of Charles Albert in favor of his son, Victor Emmanuel.

NOVA SCOTIA, a province of the Dominion of Canada, is bounded on the n.w. by New Brunswick and the bay of Fundy, on the n. by the straits of Northumberland and the gulf of St. Lawrence, and on the other sides by the Atlantic ocean. It consists of two portions, Nova Scotia proper, a large peninsula connected with New Brunswick by an isthmus about 15 m. in width, and the island of Cape Breton (q.v.). The peninsula, about 280 m. in length, and from 50 to 100 m. broad, extends in an e.n.e. and w.s.w. direction. Cape Breton lies n.e. of Nova Scotia proper, separated from it by a narrow strait called the gut of Canso, 16 m. long, and from half a m. to 2 m. wide. Sable island, which is 25 m. in length by 1½ in breadth, and is surrounded by a dangerous, widely-extended sand-bank, is situated about 90 m. from the nearest coast of Nova Scotia, in lat. 44° n. and long. 60° west. It is formed of sand-hills thrown up by the sea, some of them being about 80 ft. in height. The island is covered with wild grasses, which support herds of wild horses, known as Sable island ponies. It is in the track of vessels trading between America and Britain, and owing to the number of wrecks that take place on its shores, a superintendent and several men are stationed here for the purpose of rescuing and aiding shipwrecked mariners. The area of the province is 18,600 sq.m.; pop. '71, 387,800. The coast-line is about 1000 m. in length, and the shores, which are much indented, abound in excellent bays and harbors, of which the chief are Chedabucto bay, Halifax harbor, St. Margaret's, Mahone, and St. Mary's bays, Annapolis, Minas, and Chignecto basins, and Pictou harbor. There are numerous rivers, but few of them are over 50 m. in length; the most important are the Avon, the Annapolis, and the Shubenacadie. Nova Scotia contains about 400 lakes, of which the Bras d'Or, in Cape Breton, covers an area of 500 sq.m., or about one-sixth of the entire area of the island. The surface is irregular and undulating, but not elevated. Ranges of hills traverse the center of Nova Scotia in the direction of its length. The Cobequid mountains, 60 m. from the Atlantic and 1100 ft. high, traverse the peninsula from the bay of Fundy to the straits of Canso. The soil in the valleys is rich and fertile, producing all the fruits of temperate climates; and, especially in the n., the uplands also are fertile. The climate is remarkably healthy, its rigor being modified by the insular character of the province, and by the influence of the gulf stream. The mean temperature for the year is 42.09° at Pictou, and 48.6° at Windsor. The extreme limits of the thermometer may be stated at 15° Fah. in winter, and 95° in the shade in summer. The province abounds in mineral riches, including gold, coal, and iron. Gold was first discovered in the colony in March, 1861, on Tangier river, about 40 m. e. of Halifax. The chief diggings are along the Atlantic coast, and gold has been found in nearly 100 different localities. An act of the legislature regulating the disposal of claims and the collection of revenue from the gold-fields was passed in March, 1862. The gold mines have been worked steadily, and in many cases profitably. In 1871 the yield of gold was 19,227 oz., in value about $355,700; in 1875 the yield was 11,208 oz., valued at $201,756.

In 1875, 781,165 tons of coal and 4.467 tons of iron ore were raised in the province. Of the entire area of the colony, 10,000,000 acres are considered good land, and of these 1,028,082 acres were under cultivation. Three-fourths of the whole area are comprised in the peninsula of Nova Scotia, and the remainder in the island of Cape Breton. The principal agricultural products are: hay, wheat, barley, buckwheat, oats, rye, Indian corn, potatoes, and turnips. The waters around the colony abound in fish, as mackerel, shad, herring, salmon, etc., and the fisheries are pursued with ardor and ever-increasing success. In 1873-74 the number of men employed in the fisheries was 21,031, and the total value of the fish caught, $6,652,301. In 1873-74 the imports amounted to £2,181,470, the exports to £1,531,800; the revenue for 1873 to £134,500, the expenditure to £136,200. The number of vessels that arrived in Nova Scotia during the year ending June 30, 1874, was 4,424, of 959,114 tons, and the number that departed 3,752, of 881,268 tons. There are in the colony 1150 m. of telegraph, and 300 m. of railway. It is provided with 5 colleges, 10 academies, and 1700 grammar, normal, and other schools.

Nova Scotia is supposed to have been visited and "discovered" by the Cabots in 1497. Its first colonists were a number of Frenchmen, who established themselves here in 1604, but were afterwards expelled by settlers from Virginia, who claimed the country by right of discovery. Under the French settlers it bore the name of Acadia (*Acadie*); but its name was changed for its present one in 1621, when a grant of the peninsula was obtained from James I. by sir William Alexander, whose intention was to colonize the whole country. Having found, however, that the localities they had fixed upon as suitable for settlement were already occupied, the colonists returned to the mother-country. In 1654 the French, who had regained a footing in the colony, were subdued by a force sent out by Cromwell. By the treaty of Breda, the country was ceded to the French in 1667, but it was restored to the English in 1713. After the middle of the 18th c., strenuous efforts were made to advance the interests of the colony. Settlers were sent out at the expense of the British government. The French, who had joined the Indians in hostilities against the English, were either expelled or completely mastered, and Cape Breton, which was French till 1763, and was subsequently a separate province, was united to Nova Scotia in 1819. Nova Scotia was incorporated with the Dominion of Canada in 1867, and is represented in the Canadian parliament by 12 senators, and 20 members of the lower house. It has also its own local legislature and lieutenant governor; the legislature consisting of a council and a house of assembly elected by the counties—which are 18 in number—and the cities, the chief of which are Halifax, Yarmouth, Truro, and Pictou.

NOVATIAN, a priest of the Roman church in the 3d c., and the leader of a sect called after his name. The place and time of his birth are not known with certainty. Novatian had been a stoic philosopher, but after his arrival in Rome was converted to Christianity, and being seized with sudden illness while still a catechumen, received what was called *clinical* baptism, that is, baptism administered on a sick-bed, and without the solemn ceremonial. Such baptism was, in ordinary circumstances, an impediment to holy orders. Notwithstanding this irregular baptism, Novatian was promoted to orders by Fabian the Roman bishop; and soon afterwards showed his weakness by flying during a persecution. At this time a controversy arose about the manner of dealing with the lapsed; that is, those who fell away in persecution. Novatian at first inclined to the milder side, but on the election of Cornelius to the Roman bishopric to which Novatian had aspired, and on Cornelius taking the indulgent course toward the lapsed, Novatian, together with Novatus and some other discontented priests of Carthage, opposed his authority, and eventually Novatian was chosen by a small party, and actually ordained bishop, in opposition to Cornelius. The party who espoused his cause was called by his name. They were confined mainly, in the first instance to Rome and to Carthage, where a kindred conflict had arisen. They held that in the grievous crime of idolatry through fear of persecution, the church had no power to absolve the penitent: and therefore, although it does not appear that they excluded such sinners from all hope of heaven, yet they denied the lawfulness of re-admitting them to the communion of the church. This doctrine they extended at a later period to all grievous sins, of whatever character. Novatian may thus be regarded as the first antipope. The churches throughout Italy, Africa, and the East adhered to Cornelius; but the Novatian party set up bishops and established churches not only at Carthage, but at Constantinople, Alexandria, Nicomedia, Phrygia, Gaul, Spain, and elsewhere. They claimed for themselves a character of especial purity, and assumed the appellation of Cathari (Puritans). The time and manner of the death of Novatian is uncertain. According to Socrates (*Hist. Ecc.* iv. 28; v. 21; vii. 5, 12, 25), he died a martyr in the persecution of Valerian, but this is improbable. He was a man of considerable learning, and the work recently discovered in one of the monasteries of mount Athos, and published by Mr. Miller at Oxford in 1851, under the title of *Origenis Philosophumena*, is by some ascribed to him. His sect survived long after his death. An unsuccessful effort was made in the council of Nice to re-unite them to the church; and traces of them are still discoverable in the end of the 6th century.

NOVATION, in law, the extinguishment of an old obligation by the substitution of a new. The civil law distinguished 3 kinds of novation: 1. Where a new debt is substituted, due by the same debtor to the same creditor, but with changed terms of payment. 2. Where a substituted new debtor assumes the old debt. This kind of novation is called *delegatio*, and differs from the other kinds in that it may be completed without the knowledge of the original debtor. It can be created by an assignment, by the debtor, of the debt to another person who agrees to become responsible for the debt, and whom the creditor agrees to accept in place of the original debtor. When the novation takes place without the action of the original debtor, the transaction is called *ex promissio*, and the accepted new debtor *ex-promissor*. 3. Where the old debt is made payable to a new creditor. This is also called *delegatio*, and requires the consent of all parties. A novation was not a matter of legal presumption, but an intent to innovate, *animus novandi*, must be distinctly shown. In the absence of proof of such intent to extinguish the old debt, the debtor is liable for that, and also liable under the new obligation. There must have been a precedent obligation, the place of which can be taken by the new. The new obligation is subject to the same conditions, if any, as the old one, and if the old be void, as against good morals, the new one will be void also; but otherwise, at least in some cases, where the old debt was merely voidable—the new promise being considered as a waiver of any disability which might have been a good defense. A consent by parties capable of consenting, is requisite to the validity of a novation, though the older civil law recognized a sort of involuntary novation. All obligations are subject to novation, so that debts by specialty, warranties, legacies, etc., are as capable of novation as debts by simple contract. But it has been held in New York, that an agreement by the obligee in a bond, not to sue the obligor within a certain time, is not a novation, but a covenant, for breach of which the usual action lies. A new debtor has no rights under the old obligation, nor have the creditors any remedy against the old debtor, though the latter be solvent, and the new debtor insolvent. A novation may be conditional, in which case the old obligation subsists, till the condition takes place. All liens attached to the original debt are extinguished by its extinction, unless expressly retained by the new contract; and in an action upon the new contract, no claims or set-offs between the parties to the old contracts can be set up in defense by the new parties. A single creditor may make a contract of novation with two or more debtors, all individually liable. The term novation, in the common law, is much less used than assignment and merger. With some differences, common law and civil law novation are in the main alike. There must have been an original and now extinguished debt, whose cancellation forms the consideration for the new contract, which alone can be the subject of the action. A simple agreement to change the contract is not sufficient; the change must be ratified by the parties, and actually carried into effect. As in the modern civil law, the consent of the debtor is necessary to the novation, and the substitution of a new creditor, nor can the latter, in the absence of such consent and privity, recover against the debtor. There is no privity of contract between them, and to recover, the creditor must show such privity by setting forth a new promise upon sufficient consideration. In equity, however, a debt may be assigned without the debtor's consent, and the assignee can maintain a suit in his own name. But at law, in the absence of consent or consideration, the assignee cannot sue for the debt in his own name, and in a suit upon it, all set-offs, accounts, or equitable defenses, which could be pleaded by the debtor against the original creditor, may be used. The extinction of the original debt is in itself a sufficient consideration, and no consideration need be stated in the new contract, though one must be proved to constitute a valid defense to a suit by creditors of the assignor. The most usual case of novation in modern law, is the substitution of a new bill of exchange, or promissory note for an old one surrendered and extinguished. Wherever an intention is shown to make the new note or bill an absolute payment, it will be so held. In Maine, Vermont, Massachusetts, and some other states, the receipt of a negotiable promissory note or bill is *prima facie* evidence of payment of the debt, and it is held in Louisiana, that the receipt by the creditor for a draft in payment of the account constitutes a novation. The general rule, however, in England and in this country is that the receipt of a promissory note does not make a novation, but is merely *prima facie* evidence of a conditional payment, made absolute payment by the occurrence of the condition, i.e., the payment of the note.

NOVA ZEMBLA (Russ. *Novaja Zemlja*, "new land"), the name given to a chain of islands lying in the Arctic ocean (lat. between 70° 30′ and 76° 30′ n., and long. between 52° and 66° e.), and included within the government of Archangel. Length of the chain, 470 m.; average breadth, 56 miles. The most southern island is specially called Nova Zembla; of the others the principal are Matthew's land and Lütke's land. They were discovered in 1553, and are wild, rocky, and desolate—the vegetation being chiefly moss, lichens, and a few shrubs. The highest point in the chain is 3,475 ft. above the level of the sea. Mean temperature in summer at the southern extremity, 35.51°; in winter, 3.21°. Nova Zembla has no permanent inhabitants, but as the coasts swarm with whales and walruses, and the interior with bears, reindeers, and foxes, they are periodically frequented by fishermen and hunters.

NOVELDA, a t. of Spain, in the province of Alicante, and 18 m. w. from Alicante, on the railway between Madrid and Alicante. There are corn and oil mills, brandy distilleries, and manufactures of lace. Pop. 8,095.

NOVELLÆ. See JUSTINIAN.

NOVELLO, CLARA, a distinguished vocalist, daughter of the following, was b. in 1818. Her talent showed itself very early. At the age of 10 she became a pupil of the French academy of singing for church music, and studied in Paris for several years, following up her studies in after years in Italy and Germany. Both in England and in Italy she created quite a *furore* from the year 1840 to 1848: her singing has indeed hardly ever been equaled in equality, flexibility, and executive skill. In 1848 she married count Gigliucci, and quitted the stage, returning to it, however, for a time from 1850 to 1860.

NOVELLO, VINCENT, an eminent musical performer and composer, was b. in London, of an Italian father and English mother, in 1781. At the age of 16 he was organist in the chapel of the Portuguese embassy; and even then had attained a large measure of that proficiency on the organ for which he was celebrated in later life. He was one of the founders of the Philharmonic society. His musical compositions, which are very numerous, and chiefly sacred, are considered to have contributed much to the improvement of cathedral music. As a pains-taking editor of unpublished works of eminent musicians, he has also done great service to musical literature. He died at Nice in 1861.

NOVELS. The novel and the so-called romance, inasmuch as they constantly merge in one another, and are only superficially distinguished by the preponderance in the one of ordinary and familiar incidents, in the other of incident more or less remote and marvelous, may conveniently be included here under the common definition of prose narrative fiction. Between the legendary epic, the drama into which portions of its available material from fluent become crystallized, and the wider prose fiction or novel, into which this again expands itself, there are obvious affinities, the distinctions being rather of form than of essence. It is of the later development, the novel, that we purpose to give here a historical sketch, omitting, however, any consideration of the remoter and but slightly known specimens produced in Hindustan and China.

1. *Ancient Classical Prose Fiction.*—The earliest Greek compositions of a fictitious character, of which we possess any knowledge, are the *Milesiaca*, or *Milesian Tales*, said to have been written chiefly by one Aristides. The Milesians were a colony of Ionic Greeks who settled in Asia Minor, and fell under the dominion of the Persians, 494 B.C. They were a voluptuous, brilliant, and inventive race, and are supposed to have caught from their eastern masters, whom they somewhat resembled, a liking for that particularly oriental species of literature—the imaginary story or narrative. None of the Milesian tales are extant, either in the original Greek or in the Latin version made by Sisenna, the Roman historian, about the time of Marius and Sulla; but we have some forty stories by Parthenius Nicæas, which are considered to be to a certain extent adaptations from them. The collection of Parthenius is entitled *Peri Erotikōn Pathēmatōn*, and is dedicated to Cornelius Gallus, the Latin poet, and the contemporary and friend of Virgil. If we may judge from this later set of fictions, which are mainly concerned with the description of all sorts of seduction, of criminal and incestuous passions, and of deplorable terminations to wretched lives, we have little cause, either morally or æsthetically, to regret the loss of their more famous prototypes. In Greece proper nothing was done, so far as we know, in the way of novel or romance until after the age of Alexander the great. It has been conjectured, not improbably, that his eastern conquests had a potent effect in giving this new bent to the fancy of his countrymen. Clearchus, a disciple of Aristotle, wrote a history of fictitious love-adventures, and is thus, perhaps, to be considered the first European Greek novelist, and the first of the long series of *erotikoi*, who reach down to the 13th c. after Christ. Not long after came Antonius Diogenes, whose romance, in 24 books, entitled *Ta hyper Thoulen Apista* (of the incredible things beyond Thule), was founded on the wanderings, adventures, and loves of Dinias and Dercyllis. It appears to have been held in high esteem, and was at least useful as a store-house, whence later writers, such as Achilles Tatius, derived materials for their more artistic fictions. The work has not been preserved, but Photius gives an outline of its contents in his *Bibliotheca Cod.*

A long interval, embracing, indeed, several centuries, now elapses before we come upon another Greek novelist or romancist. Be the cause of this what it may, the ever-increasing luxury and depravity of the pagan imperial world, combined to develop and intensify that morbid craving for horrible, magical, and supernatural incidents which in general fill the pages of the romancists of the empire. The first names that occur in the new series are Lucius of Patra (*Patrensis*) and Lucian (q.v.), who flourished in the 2d c. A.D., during the reign of Marcus Antoninus; but as the former simply collected accounts of magical transformations (*metamorphoses*), he is perhaps not to be regarded as a novelist proper at all; while the latter was really a humorist, satirist, and moralist in the guise of a story-teller—in a word, a classic Rabelais and Heine, and as far as possible from being a member of the wonder-loving school of erotics, with whom he has only an accidental connection by the external form of some of his writings. The first of the new series of romance writers, strictly so called, is properly Iamblichus (*not* the Neoplatonic philosopher), whose *Babylonica* is, indeed, no longer extant; but we are able to form a pretty just estimate of it from the epitome of Photius. The next notable name is that of Heliodorus (q.v.), bishop of Trikka, who flourished in the 4th c. A.D. This Christian writer, whose *Loves of Theagenes and Chariclcia* is really the oldest extant *erotic* romance, has far excelled all his predecessors in everything that can render a story interesting or excellent, and his charming fiction obtained a great popularity among such as could read. Some imagine that they see in Heliodorus a resemblance to the minutely descriptive style of novel introduced into England by Richardson, but without adopting this rather extreme notion, it can at least be safely asserted that Achilles Tatius and all the subsequent *erotikoi* deliberately imitated his style and manner, while he was not less certainly used as a model by that once celebrated but dreadfully tedious school of heroic romance which flourished in France during the 17th c., and whose best-remembered representative is mademoiselle de Scudéri. Tasso, Guarini, D'Urfé, and several other modern writers have drawn many particulars—sometimes almost *verbatim*—from the stories in the *Theagenes and Charicleia*. Achilles Tatius (q.v.), probably belonging to the 5th c., ranks next to but at some distance from Heliodorus in point of merit. His romance, entitled *Ta kata Leukippen kai Kleitophonta*, and consisting of eight books, has supplied incidents to more than one Italian and French writer.

The next work that invites our attention in point of time, the *Daphnis and Chloe* of Longus, is of a totally different character. It is a simple and picturesque prose-pastoral, with no poisonings, murders, magic, supernaturalism, and impossible exploits. Over the whole story rest a rural peace and a smile of cheerful sunshine; and, in spite of some singularly polluted passages, it was, for its time, a pure and wholesome fiction. *Daphnis and Chloe* is the only pastoral romance produced by any Byzantine author. Whether or not it exercised any influence on the development of the *modern* pastoral of Italy and France cannot be proved, but it has been noticed that there is no slight resemblance between it and the story of the *Gentle Shepherd*, which we know was suggested to Allan Ramsay by a classical friend, who may have borrowed from the Greek the sketch which he gave to the poet. It has also been very closely imitated by Gessner in his idyl of *Daphnis*.

After Longus comes Chariton (flor. some time between the 6th and 9th centuries), whose romance, in eight books, on the *Loves of Chæreas and Callirrhoë*, is not quite complete, but nearly so. It contains, like the other erotic fictions, plenty of stirring and startling adventures, but on the whole these are less improbable than what we encounter in the writings of his predecessors. Of three Xenophons, also noted among the *erotikoi*, and of uncertain date, the best is Xenophon of Ephesus, whose romance, entitled *Ephesiaca, or the Loves of Anthia and Abrocomas*, is in ten books, and has all the sensational characteristics of the school to which it belongs. It is, however, perhaps worth mentioning that in the romance of Xenophon we meet for the first time with the story of the love-potion, the pretended death, and the mock-entombment of the heroine, which forms the leading incident in Shakespeare's *Romeo and Juliet*, and which, it is thought, reached the great English dramatist at second or third hand, through the Italian novelist Luigi da Porta.

Again a long interval elapses before we meet with another love-fiction of the old pagan sort. During this period, however, a work made its appearance which was essentially a romance, and was composed expressly for the purpose of recommending that form of Christian life which was *the* favorite in early times—the ascetic and recluse form. This was the *Barlaam and Josaphat* (q.v.), the author of which is unknown, but whose popularity, during the middle ages, may be estimated from the fact that it was translated into every language of Christendom from Norway to Spain. In the 12th c. another erotic, Eustathius or Eumathius, who was properly the last of the series, published his *Ismene and Ismenias*, in eleven books. This romance is, in truth, a feeble performance; the expiring flicker of a lamp whose oil is about done. It is puerile in its delineation of character, and full of plagiarisms; yet many of its details have been copied by later occidental writers, such as D'Urfé and Montemayor.

In all the erotic romances the adventures, which in fact constitute the story, have certain common characteristics. The hero and heroine are generally carried off by robbers or pirates; or they flee from home, and are accidentally separated. They resolve to seek each other throughout the world, and in the course of their loving quest they visit the remotest regions, encounter the most frightful perils, make hairbreadth escapes from tragic ends, meet again in most unexpected and miraculous ways, and generally close their career in happiness and splendid prosperity—often turning out to be the offspring of far greater people than they fancied. Copious use is made of poisons, love-potions, improbable tricks, magic instruments, etc.; and one can easily see that the stories were meant to tickle and stimulate a languid, corrupt, sensual, and credulous people, such as the Greeks of the lower empire undoubtedly were.

Before touching on the mediæval romance of western Europe we may in a few words notice such specimens of classical fiction as exist, or are known to have existed in Latin. We have already stated that the Milesian tales were translated into that tongue by Sisenna, who derived his knowledge of them from the Sybarites, a Greek colony of lower Italy. The taste for similar stories increased during the empire, but the writers in general cannot have displayed much genius in their compositions if we may judge from the contemptuous language used by the emperor Severus against Clodius Albinus, whose fictions he designates *ludicra literaria*, and *anilia* (old wives' tales). But higher praise must be assigned to the work commonly attributed to Petronius Arbiter (q.v.), who flourished in the time of Nero, and whose *Satyricon*—incomplete—is a comic novel or romance, and (although the dirtiest work even in pagan literature) is executed with skill, vigor, and at times, with beauty. In the 2d c. A.D., Appuleius (q.v.), wrote his *Ass* (called from its excellence the *Golden Ass*), which relates the adventures of a young man who had the misfortune to be accidentally metamorphosed into that animal while sojourning in Thessaly: retaining, however, his human consciousness. The miseries which he suffers at the hands of robbers, eunuchs, magistrates, and other persons into whose hands he falls, until the period when he is enabled to resume his former figure, are portrayed with a wit, humor, and fancy, hardly inferior to Lucian. The work is also believed to have had, like the writings of his Greek contemporary, a moral and satirical aim. It was immensely popular in the middle ages; has supplied Boccaccio with some of his stories, and the author of *Gil Blas* with the picturesque incidents of the robbers' cave in the early part of *his* romance, and contains in the episode of *Cupid and Psyche* one of the loveliest allegories of classical antiquity.

2. *Romantic fiction in western Europe.*—The first thing to be clearly understood in connection with this branch of literature is, that it is *not* a continuation of the Græco-Byzantine or classical fiction, though, curiously enough, it began to spring up in the west just as the other was dying out in the east. It is a completely new growth, the product of new historical circumstances, which were but very slightly affected by Byzantine influences of any kind; and it transports us into a world of ideas, sentiments, beliefs, and actions, as different from what we find in the *Erotikoi* as could well be imagined. In the latter, the principal characters are mere lovers *forced* into adventures by the ministers of fate; in the former, they are real heroes, of the old Homeric type, and *seek* dangers greedily and joyously. When we read the *Erotikoi* we are reminded in many ways that we are in the midst of a corrupt and decaying civilization; when we turn to the romances of chivalry in spite of certain superficial and barbarous vices—such as the prevalence of bastardy, and the indifference displayed to bloodshed—we feel that we are in the presence of a youthful, healthy, vigorous, and growing social life. That these romances, generally from beginning to end, consist of a series of extraordinary and utterly impossible exploits, in which the magic, the mystery, and the enchantments of the *Arabian Nights* are rivaled or outshone, is unquestionable; but this proves no more than that the races of western Europe, who slowly, during the dark ages, rose, by the help of the church, out of barbarism into feudalism—the first step toward the civilization of the modern world—were boundlessly ignorant, credulous, and wonder-loving. Their prodigious vigor and vehemence of character, having no proper intellectual *pabulum*, was forced to supply its craving for a knowledge which was beyond its immediate attainment, by the exaggerations of a fancy that was without law or limit. We need not go so far as to assert that, in the mediæval romance, everything is of native or "Gothic" origin; the fact is very much the reverse. This extreme theory, propounded by Mallet, and supported by bishop Percy, and other writers, is totally inadequate to account for all that is contained in these romances. Not less inadequate is another theory, first suggested by Salmasius, and afterward elaborated by Warton, that the mediæval romance is mainly of Saracenic origin, and was probably introduced by the Moorish conquerors into Spain, and thence propagated into France and Britain; while a third theory, which has also found supporters, viz., that it was derived from the classical mythology of ancient Greece, is the most inadequate of all. The true explanation of the matter appears to be that mediæval romance had its root and foundation in chivalry (q.v.)—a genuine product of western Europe—and although the machinery, so to speak, the exploits and the marvels, may have often been derived from the foreign sources we have mentioned, yet the spirit, scenery, sentiment, and life of the legends thoroughly reflect the characteristics of the earlier ages of feudalism. The notions of dragons, giants, magic rings, enchanted castles, are probably of Saracenic origin, and may have been introduced into Europe by the horde of pilgrims who visited the east in the time of the crusades; such incidents as the detaining of a knight from his quest by the enchantments of a sorceress may have been a tradition of the *Odyssey* of Homer; but the gallantry, the courtesy, the romantic valor, the tournaments, the noble friendships of brother-knights—all that distinguishes the romances of chivalry from Runic legends, or the *Arabian Nights*, cannot be traced to any other source than the new-born chivalry of Europe.

The mediæval romances are divisible into three great series—1. Those relating to Arthur and the knights of the round-table. 2. Those relating to Charlemagne and his paladins. 3. Those relating to Amadis de Gaul, and his descendants.

The Arthurian series is, in its essence, of Welsh and Armoric origin. Its genesis is as follows: First came the legendary chronicles composed in Wales or Brittany, such as the *De Excidio Britanniæ* of Gildas (q.v.); the chronicle of Nennius, belonging to the 9th c.; the Armoric collections of Walter Calenius or Gualtier, archdeacon of Oxford; and the famous *Chronicon sive Historia Britonum* of Geoffrey of Monmouth (q.v.)—from these, and from the multitude of floating unrecorded traditions, sprung the *metrical*, which in turn gave birth to, and were ultimately superseded by, the *prose* romances. It is with the latter alone that we have here to do. They, like the metrical romances, were composed by Anglo-Norman authors (whose names are unknown) during the 13th, 14th, and 15th centuries, who took all the more willingly to the old British legend that in these the "Saxons" were the objects of the authors' hatred and detestation. The principal romances of the Arthurian cycle are those of *Merlin* (q.v.), the enchanter; of *Arthur* (q.v.); of the Sangreal (see GRAAL); of *Perceval;* of *Lancelot du Lac;* of the princes of Lyonnesse, *Meliadus* and his son *Tristan;* and of *Isaie le Triste*, the son of Tristan. They relate the marvelous adventures, exploits, loves, and gallantries of the knights of the round-table, and are probably in substance the oldest of the mediæval prose romances. The scenes are generally laid in Wales, Cornwall, Brittany, Ireland, or Scotland; only in one or two of the series are we taken as far as Egypt or India; and though Arthur is slain by "Saracens" who supported his nephew, Mordred, and a general eastern coloring is present in the cycle, yet it is "Saxons" who are his principal foes.

The series of Charlemagne and his paladins is of purely French origin, and originated in a somewhat similar fashion to the Arthurian cycle; that is to say, there was first a legendary chronicle (in verse, however), entitled *Historia de Vita Caroli Magni et Rolandi*, erroneously attributed to Turpin or Tilpin, archbishop of Rheims, and contemporary of Charlemagne, but probably executed in the 11th or 12th centuries; then came a series of metrical romances, strictly so called, which were gradually supplanted by their prose counterparts, the authors of which last, however, appear to have diverged more from the metrical originals, and to have been more free and fanciful than their predecessors of the Arthurian cycle. The principal are *Huon of Bordeaux* (the incidents of which are followed by Wieland in his *Oberon*), *Guerin de Monglave*, *Gaylen Rhetoré* (in which Charlemagne and his paladins proceed *incognito* to the Holy Land), *Miles and Ames*, *Jourdain de Blaves*, *Doolin de Mayence*, *Ogier le Danois*, and *Maugis the Enchanter*. In these romances we are, in some respects, on totally different ground from that on which we find ourselves in the Arthurian series. We are transferred to the east—to Africa, Palestine, Arabia, Bagdad, Constantinople, India, Persia, the Caspian sea, etc. We are introduced to the courts of Saracen "princes," "sultans," and "emirs;" and see Mohammedan maidens of peerless beauty falling in love with Christian knights, and for their sakes abandoning, or even betraying father, mother, brethren, and kinsmen. Fairies, who figure but slightly in the Arthurian romances, play a frequent and an important part in these; demons, dervishes, apes, talismans, palaces with cupolas and gilded roofs, splendid jewels, diamonds, etc.—everything, in fact, shows the influence exercised on the imagination of western Europe by the glowing scenery, the brilliant life, and the gorgeously fanciful superstitions of oriental lands.

The series relating to Amadis de Gaul and his descendants is sufficiently characterized under the head of Amadis (q.v.). We may only observe, as a proof of the comparative lateness of their composition, that the "Saracens" of the French romances here give place to "Turks;" and as the eyes of Europe were turned toward the tottering Greek empire, many of the scenes of warfare are laid at Constantinople.

Besides the three distinct series of romance above-mentioned, a fourth, perhaps, deserves mention, in which the heroes of antiquity are grotesquely tricked out in the costume of mediæval knights. The exact date of their composition cannot be ascertained; but they were probably later in general than any of the other three series; and, at any rate, were for the most part not published till the end of the 15th and the beginning of the 16th centuries. The principal are the romance of *Jason and Medea*, of *Hercules*, of *Œdipus*, and of *Alexander*. They are all written in French, and the first two profess to be the work of a Raoul le Febre. An attempt is made to adhere, in the general outline of the stories, to the ancient myths, but most marvelous embellishments are added, such as only the middle ages could have conceived; while the transformations that the classical personages undergo are exceedingly ludicrous. Jove becomes a "king;" Mercury his "squire;" the fates "duennas:" Cerberus and the sphinx, "giants;" etc.

Before leaving this division of our subject we would observe that, though the romances of chivalry may appear infinitely tedious and absurd to a modern reader, they were immensely relished and admired during the ages in which they were produced: were widely disseminated, in different forms, throughout all Christendom, and were highly popular with later poets. The influence which they exercised on Pulci, Boiardo, Tasso, Spenser, etc., shows the strong hold that they must have had on the imagination of Europe; but, with the decline of chivalry, the spread of the more rational and artistic fictions of the Italian novelists, the revival of letters, and the general advancement in civilization of Christendom, the taste for the romances of chivalry also declined, until finally Cervantes laughed them out of literature, and well-nigh out of memory, in the beginning of the 17th century.

3. *Development and Influence of Fiction in Italy.*—The Italians originated no romances of the kind described above. This resulted from various causes, the principal of which perhaps are: 1st, that they were really not a Gothic, but at least a semi-classic people; 2d, that they were more polished than the northern nations; and 3d, that instead of feudal chivalric institutions, the most characteristic *political* features of Italy, during the middle ages, were mercantile and lettered republics. There was what may be roughly called a *middle class*—of merchants—in Italy, when England and France and Spain contained really little more than nobles and serfs; and these were really the best instructed and the most enlightened portion of the community. Hence it is but natural that we should find a style of fiction mirroring to some extent this more civilized and sober form of social life. That the classical romances had some influence on the development of Italian fiction is probable; several of the tales recorded in the love-letters of Aristinetus, and in the *Golden Ass* of Appuleius, are quite like what we read in Boccaccio and others. The

fables of Pilpai or Bidpai (q.v.), translated into Latin as early as the 13th c., were also not without a certain effect; but it is to the Arabico-Indian book of the seven counselors (better known as *The Tales of the Seven Wise Masters*), still more to the stories of Petrus Alphonsus (whose work is entitled *De Clericale Disciplina*), and the *Gesta Romanorum* (q.v.), a grotesque jumble of classical stories, Arabian apologues, and monkish legends, in the disguise of romantic fiction; but most of all perhaps to the *Contes* and *Fabliaux* (q.v.) of the French poets, that we must look for the first sources of those almost innumerable *novelletti* which mark the earlier literary history of Italy.

The earliest Italian work of this sort is the *Cento Novelle Antiche*, commonly called *Il Novellino.* It is a compilation by different hands—all unknown—of stories floating about, or taken with modifications from the sources above-mentioned, with one or two of the more graceful episodes in the romances of chivalry, and was executed towards the close of the 13th century. It was followed in 1358 by the *Decameron* of Boccaccio (q.v.)—the finest, in point of humor, sentiment, and style, of the whole set, but not more original in the matter of story than *Il Novellino.* Its influence on early European literature was prodigious. Chaucer and Shakespeare in England have been in particular greatly indebted to it for incidents and plots; while in France—from whose Trouvères he had himself derived so much—Boccaccio had a number of distinguished imitators. In his own country his influence was so overwhelming that for some centuries Italian novelists could do nothing more than attempt to copy him. The principal of these imitators are Franco Sacchetti (1335–1410), Ser Giovanni (who began to write his novelletti in 1378, from which Molière got the plot of his *Ecole des Femmes*, and Shakespeare probably part of his story of the *Merchant of Venice*—though the story of the bond is far older, and is of Persian origin—Chaucer is also indebted to this Italian); Massuccio di Salerno (flor. about 1470), more original than most of the post-Boccaccian novelists; Sabadino delli Arienti (flor. about 1483); Agnolo Firenzuolo; Luigi da Porta; Molza, and Giovanni Brevio (flor. at the close of the 15th and in the first half of the 16th c.); Girolamo Parabosco (flor. 1550); Marco Cademoste da Lodi (1544); and Giovanni Giraldi Cinthio (died 1578), noted particularly for his extravagant employment of sanguinary incidents, and the introduction of scenes of incredible atrocity and accumulated horrors. The seventh of his third decade of stories contains the story of Othello, the Moor of Venice; the plot of *Measure for Measure* was also derived indirectly from him. Cinthio was, in fact, the greatest favorite of all the Italian novelists with the Elizabethan dramatists. Besides these, we may further mention Antonio Francesco Grazzini (died 1583); Straparolo (wrote 1554 *et seq.*) from whom Molière, and also the French writers of fairy tales, derived numerous hints; while the ludicrous incident embodied in the Scottish song of *The barrin' o' our door* forms one of the stories of this writer; Bandello (died 1555), the most widely known and read (out of Italy) of all the Italian novelists next to Boccaccio, and in whom we find the original of Massinger's play of *The Picture*, and of Shakespeare's *Twelfth Night;* Granucci (published 1574); Malespini (published 1609); and Campeggi (early part of 17th c.). The best French imitations of these Italian tales are the *Cent Nouvelles Nouvelles* (printed 1456, and translated into English under the title of the *Hundreth Mery Tayles*, 1557). They are full of life, gayety, and imagination, and are written in a most naïve and agreeable manner; and the *Heptameron* of Margaret, queen of Navarre, from which Shirley, the English dramatist, has taken the plots of two of his comedies.

A few words may also be devoted here in passing to a very different class of fiction—the *Spiritual Romance.* It originated, without doubt, in the bosom of the church, and from the desire to edify, by stories of religious knight-errantry, a rude and ignorant community, incapable of understanding or relishing abstract doctrines. The first of the series is *Barlaam and Josaphat,* already alluded to; but by far the greatest work of the kind produced during the middle ages is the *Legenda Aurea*, or Golden Legend (q.v.), itself believed to be drawn from different and now partly forgotten sources. Besides these may be mentioned a species of spiritual tale—the *Contes Dévots*, prevalent in France during the 12th and 13th c., and which were written by monks, probably with the view of counteracting the witty and licentious stories of the Trouvères; but curiously enough, in these pious fictions, the lives of monks and nuns are represented as far more immoral than in those of the secular satirists. The things, too, which the virgin Mary is represented as doing are most astounding, and throw a strange but valuable light upon the religious notions of the age. In one story she conceals the shame of a favorite nun; in another, she performs the part of a procuress; in a third, she officiates as midwife to an abbess who had been frail and imprudent; and in general, she performs the most degrading offices for the most worthless characters.

Romance of the 16th and 17th Centuries.—During the middle ages, the universal sway of the church and the institutions of feudalism gave a certain character of uniformity to the modes of life, and thereby to the social literature of western Europe; but after the epoch of the reformation, and even earlier, this uniformity disappears, and we find in every direction a tendency to the opposite extreme of individualism. This tendency manifests itself especially in the fiction of the period, which, vastly increasing in quantity and varying in quality, becomes difficult to classify. We shall, however, endeavor to group the products of modern prose-fiction works under what appears to us a convenient chronological heading.

During the 16th and 17th centuries, four different kinds of romance or novel were cultivated—1. *The Comic Romance;* 2. *The Political Romance;* 3. *The Pastoral Romance;* 4. *The Heroic Romance.*

Comic Romance substantially begins in modern times with Rabelais (q.v.), styled by sir William Temple the *father of ridicule.* Others, indeed, had preceded him in the same path, but they had acquired no celebrity. In him we see unmistakably one form of the modern spirit—its daring freedom of speculation, criticism, and satire, also that lack of reverence exhibited by those who, at the period of the reformation, clearly discerned the abuses of the church, but had not faith in the possibility or efficacy of reforms. Thus Rabelais, in his inimitable burlesque romance, scoffs (with the tone of a skeptic, however) at the vices of the clergy, the crooked ways of politicians, the jargon of philosophers, and the absurdities of the *Contes Dévots*, and of the mediæval tales generally. The next remarkable romance of a comic nature is the *Vita di Bertoldo* of Julio Cesare Croce (flor. at the close of the 16th c.), a work recounting the humorous and successful exploits of a clever but ugly peasant, and regarding which we are told that for two centuries it was as popular in Italy as *Robinson Crusoe* or the *Pilgrim's Progress* in England. The substance of the story can be traced back to an oriental source. A few years later appeared *Don Quixote* (see CERVANTES), in which "war to the knife" was proclaimed against the romances of chivalry, and in which, perhaps, we see more distinctly than in any other fiction of the period the new *turn* that the mind of western Europe had taken. Almost contemporaneous with *Don Quixote* was another Spanish romance—Matteo Aleman's *Life of Guzman Alfarache,* successively beggar, swindler, pander, student, and galley-slave. In this work, as in others of the same sort, we find several indications of the influence of the Italian novelists. It has been supposed that *Guzman Alfarache* suggested to Le Sage the idea of *Gil Blas*, and there *is* some resemblance between the two; but, at any rate, it gave birth to a host of Spanish romances with beggars and scamps for heroes, of which the best is the *Lazarillo de Tormes*, by Diego de Mendoza (1586). In the following century France produced, among others, Scarron's *Roman Comique*, and Furetiere's *Roman Bourgeois*. England and Germany have nothing to show in this department.

Political Romance was manifestly suggested partly by the great politico-ecclesiastical changes that took place in Europe in the first half of the 16th c., and partly by the immense increase in the knowledge of the manners and customs of remote nations, occasioned by geographical discoveries and mercantile adventure. The earliest of the series is the *Utopia* of sir Thomas More; next comes the *Argenis* of Barclay, published in 1621; and to the same class belong a variety of French romances produced about the close of the 17th and the beginning of the 18th c., of which by far the most famous is the *Télémaque* of Fénelon.

Pastoral Romance.—All through the middle ages, the fame of Virgil kept up a certain interest in compositions devoted to the delineation of rustic or shepherd life. We even find in the poems of the troubadours several specimens of the erotic pastoral; and the *Ameto* of Boccaccio furnishes us with a prose illustration of the same. But it was after the revival of letters that this branch of fiction, so essentially classical, was most assiduously cultivated by men of scholarly genius; and though their works have not retained the popularity they originally enjoyed, they are still interesting and valuable from an historical point of view, and abound in descriptive passages of great beauty and sweetness. The pastoral life which they portray, however, never existed either in Greece or elsewhere. Their shepherds and shepherdesses are as unreal and unhistorical beings as the knights of mediæval romance. The first important work of the kind is the *Arcadia* of Sannazzaro, written in Italian about the end of the 15th century. It was followed by the *Diana* of Montemayor, written in Spanish, about the middle of the 16th c., several of the episodes of which are borrowed from the Italian novelists; while Shakespeare has in turn directly taken from it the plot of the *Two Gentlemen of Verona*, copying occasionally the very language, as well as some of the most amusing incidents in his *Midsummer Night's Dream*. The *Diana* was imitated in French by Honore d'Urfé, whose *Astrée* (1610–25) was for a long while held in the highest esteem, and is really, in spite of its tediousness, a work of great learning and considerable merit. Twenty years before the appearance of *Astrée*, sir Philip Sidney wrote and published his *Arcadia*, as tiresome, and in substance as unreal, as any production of the same school, but in stateliness and melody of language, in luxury of fancy, in nobility and purity of sentiment, far exceeding them all.

Heroic Romance owed its origin partly to the immediate antecedent pastoral romance, partly to an increased acquaintance with classic history, produced by the translation of such books as *Plutarch's Lives*, and partly to the interest excited in the Moors of Granada by a splendid romance in Spanish (professing, however, to be a *history*) entitled *The Dissensions of the Zegris and the Abencerrages*, and was printed at Alcala in 1604, and which soon became extremely popular, especially in France. It was in the latter country alone that the *Romans de Longue Haleine* (Long-winded Romances), as they have been happily nicknamed, were cultivated. The first of this heavy series was the *Polexandre* of Gomberville, published in 1632, in which the influence of the early Greek romances is visible. His successor, Calprenede, the best of a bad lot, wrote *Cleopatra*, *Cassandra*, and *Pharamond*. But the most prolific, and consequently the most intolerable of the school, is Mme. de Scudéri, whose principal romances are *Ibrahim, ou l'Illustre Bassa; Clelie; Histoire Romaine; Artamenes, ou le Grand Cyrus;* and *Almahide.* The pompous dignity, the hyper-polite address, the dreadful dullness, and the hollow ceremonialism of these ridiculous performances, admirably (if unintentionally) mirror the features of French court-life during the time of the *Grand Monarque.* The heroic romances did not long retain their meretricious reputation. Molière, and still more, Boileau, in his satire *Les Héros de Roman, Dialogue,* ridiculed them to death, and in consequence, Mme. de Scudéri had no successor.

NOVELS AND ROMANCES OF THE 18TH CENTURY.—The two European nations that most brilliantly distinguished themselves in the department of fiction during this century were England and France, and to these we shall chiefly confine our attention.

1. *English Prose Fiction.*—During the age of Elizabeth and her immediate successors, the imaginative genius of England, from various causes, had taken an almost exclusively poetical direction, and with the exception of Sidney's pastoral of *Arcadia,* and Bunyan's *Pilgrim's Progress,* we meet with nothing in the shape of a novel or a romance for a hundred years. The 17th c. has nothing to show till it approaches its close. This is doubtless owing, in part at least, to the intensity of the great political struggle that agitated and rent England during the first half of that century, and gave an austere theological bias to society. The Puritans, in their day of triumph, would not tolerate either comic or heroic romances. They set their faces "like flint" against all imaginative fiction, which they considered as little better than lying; and even to this day that class of people commonly described as "the religious portion of the community," in some sense the representatives of the Puritans, betray the legitimacy of their spiritual descent by their aversion to all sorts of secular tales. After the restoration, however, an extraordinary change came over the English nation, or at least over the upper and wealthier classes. These rioted in the excess of a coarse and licentious reaction against the rigorous piety and fanaticism of the commonwealth. This turbid viciousness by and by calmed down, but it left a certain taint of sensualism and materialism in the habits and life of the people, which, in the opinion of some competent critics, marks them to this day. It is certain that at the beginning of the 18th c. England was entering on the most prosaic, unimaginative, and unheroical period of her history. Its characteristics are faithfully reflected in most of her novels, which, as pictures of the gross dull life, the paltry thoughts, the low sentiments, the modish manners, and the loose morality that prevailed, possess a great historical value apart altogether from their literary merits. The first name that occurs is that of the notorious *Aphra Behn* (q.v.), the greater number of whose novels, of which *Oronoko* is the best known, appeared towards the close of the reign of Charles II., but are included here in the literature of the 18th c., as they belong to it by the nature of their contents, and not to the 17th c. types of fiction. She was imitated by Mrs. Heywood (born 1696, died 1758), of whose *Love in Excess, The British Recluse,* and *The Injured Husband,* it has been remarked that "the male characters are in the highest degree licentious, and the females as impassioned as the Saracen princesses in the Spanish romances of chivalry." A later work, however, *The History of Miss Betsy Thoughtless,* is of a higher stamp, and is supposed to have suggested the plan of Miss Burney's *Evelina.* But the first novelist of great genius belonging to the new era is Daniel De Foe (q.v.), the father of modern English prose fiction, in whose writings—*The Adventures of Captain Singleton, The Fortunes of Moll Flanders, The History of Colonel Jack,* etc.—the coarse, homely, unpoetical, but vigorous *realism* of the time is strikingly apparent. Perhaps the Spanish ragamuffin romances may have furnished him with some hints. *Robinson Crusoe* is the finest and the most famous of all that class of fiction which was extensively cultivated both in France and England during the earlier part of the 18th c., and which received, in the former country, the name of *Voyages Imaginaires.* To the same class (outwardly at least) belong Swift's *Gulliver's Travels,* though at bottom this is a satirical romance, like the works of Rabelais, and the *Gaudentio di Lucca,* a sort of politico-geographical fiction, generally attributed to Bishop Berkeley. After De Foe comes Richardson (q.v.), very unlike any of the novelists of his age—to appearance! His muse is a most decorous prude, and never utters anything rude, or vulgar, or licentious; but though she was inspired with the best intentions, her notions of how virtue should be rewarded indicate the coarseness of the time, hardly less than the debaucheries and seductions of Fielding and Smollett. The principal novels of Richardson are, *Pamela; Sir Charles Grandison;* and *Clarissa Harlowe.* Fielding (q.v.) thought Richardson untrue to nature, and wrote his first novel of *Joseph Andrews* as a burlesque on the style of his predecessor. Like his subsequent performances, *Tom Jones* and *Amelia,* it represents society as Fielding's sharper eyes saw it, on the whole, gross, vulgar, and impure. Smollett (q.v.), with a different style of genius, continues to paint in the same spirit. His chief works are, *Roderick Random; Peregrine Pickle; The Adventures of Ferdinand Count Fathom;* and *Humphry Clinker.* Sterne (q.v.), belonging to the same period, exhibits a genius so whimsical, peculiar, and original, that it is almost impossible to class him with any of his contemporaries. His *Tristram Shandy* is a work *sui generis,* but nowhere is the coarse impurity and indelicacy of the age more conspicuous. Four years later appeared Goldsmith's *Vicar of Wakefield,* in which a change for the better, in a moral point of view, is first noticeable. With the exception of Richard-

son, all the novelists above mentioned are usually, and we may add correctly, described as *humorists*. Other qualities they have besides, but this is the most common and predominant. When this school was passing away about 1760–70, another was on the eve of being born. The publication of Percy's *Reliques* had reawakened an interest in the age of chivalry and romance. Readers had become tired of the long prevalence of prosaic fiction, in spite of the splendid genius devoted to its illustration. It had done its work, and could create no more. The first of the modern romantic school was Horace Walpole, whose *Castle of Otranto* appeared in 1769. It was followed by Clara Reeve, the authoress of the *Old English Baron*, a romance that every school-boy, we hope, remembers with the deepest gratitude; but the greatest genius in this line was undoubtedly Mrs. Radcliffe (q.v.), whose *Mysteries of Udolpho* and other works, though now almost forgotten, were once greedily devoured and abundantly imitated. The ablest of her successors were Matthew Gregory Lewis, author of *The Monk* (1796), and Maturin, author of *Montorio* (1808). In all the romances of this school, the incidents are of the most startling, terrible, and often supernatural character, and the scenery is in keeping with the incidents. Fierce barons, mysterious bandits, persecuted maidens, gloomy castles, secret passages, deep forests, murders, ghosts, haunted chambers, etc.; everything that could charm, by way of contrast, and pleasantly horrify the languid, matter-of-fact, skeptical 18th c., is to be found in their exaggerated pages.

A few novelists remain to be mentioned who are incapable of particular classification. These are Dr. John Moore (q.v.), author of *Zeluco*, etc., Godwin (q.v.), author of *Caleb Williams*, *St. Leon*, etc., in whom the free-thinking and revolutionary spirit that seized many minds after 1789 is conspicuous; Mrs. Inchbald (*Nature and Art*, *A Simple Story*, etc.); Charlotte Smith (*Old Manor House*, etc.); Miss Austen (*Pride and Prejudice*, *Emma Persuasion*); and Maria Edgeworth, whose sketches of Irish character first suggested to Walter Scott—the idea of attempting for Scotland a series of like illustrations.

2. *French prose fiction in the 18th century.*—It is not easy—perhaps not possible—to trace the causes that led to the cultivation of the different kinds of fiction which flourished in France during this century, and particularly during the first half of it. The natural love of change—of novelty; the accidental influences of foreign literature; the disposition, so peculiarly French, to satirize prevalent follies and vices; the wish, on the other hand, to amuse the leisure moments of a luxurious, superstitious, and profligate society: all these and many other causes unquestionably assisted in determining its diverse development. Four kinds have been distinguished: 1. *Pseudo-historical Romance*, the literature in which department, although copious enough, neither deserves nor requires special notice. 2. *Romance in which the incidents, though natural, are purely imaginary*. 3. *Satirico-moral Romance*. 4. *Fairy Tales*, to which may be associated the imitations of *Oriental Tales*, and the *Voyages Imaginaires*.

2. *Romance in which the incidents, though natural, are purely imaginary.*—This class more nearly corresponds with the modern conception of the novel than any of its predecessors, and probably had its prototype in *La Princesse de Clèves* and *Zaide*, by the comtesse de Lafayette, who flourished in the latter half of the 17 c.; but the first great name that adorns it is that of Marivaux (1688—1763), whose *Vie de Mariamne* and *Paysan Parvenu* were long in high favor. They have this in common with the contemporary English fiction, that everything in them is produced by ordinary means, and the interest of the reader is sought to be awakened by the vivid and powerful portraiture of natural feelings, while the incidents, if often highly romantic, are always sufficiently probable to insure the credence of the imagination. Next to Marivaux comes the Abbé Prevost, q.v. (1693—1763), who first "carried the terrors of tragedy into the novel." He was a most voluminous writer, but the work by which he is now chiefly remembered is *Manon L'Escaut*, recounting the adventures of a kept-mistress and swindler, the purpose of which appears to be similar to that of *La Dame aux Camelias* of Dumas *fils*—viz., to show how noble, true-hearted, and self-sacrificing a prostitute may be! Other writers belonging more or less strictly to the same division are Madame Riocoboni (flor. 1750) and Rousseau (q.v.) in whose *Heloise* we begin to see the dawn of that fierce natural impure passion, and that extravagant scorn of conventional life, that culminated in the sanguinary paroxysms of the revolution.

3. *Humorous and satirical romance.*—By far the most celebrated specimens of this kind of fiction produced in France during the 18th c. are the *Gil Blas*, the *Diable Boiteux* and *Le Bachelier de Salamanque* of Le Sage, q.v. (1668—1746), all of which were suggested by the prolific comic romancists of Spain, Juan de Luna, Quevedo, Cervantes, Espinel, from some of whom he has borrowed, with hardly any variation, whole scenes and stories, as well as from more ancient sources. The best parts, however, are his own, and the spirit of the work is thoroughly French in the gay and lightsome vivacity of its humor. It is with some hesitation that we place the younger Crebillon (q.v.) in the same category, for the licentiousness of his *Egarements du Cœur et de l'Esprit*, and other novels, is far more apparent than their satire or humor. Bastide and Diderot (q.v.) hold an equally doubtful position as satirists or humorists; but Voltaire (q.v.) may fairly claim to rank among the former, in virtue of his *Candide*, *Zadig*, *L'Ingénu*, *La Princesse de Babylone*, etc., most of which contain covert attacks on superstition and despotism, under the forms in which Voltaire best knew them. Voltaire, however, had not a rich

imagination, and, in consequence, has been obliged to help himself liberally in the matter of incident from older writers.

4. *Fairy tales, etc.*—A very careful inquiry might probably succeed in tracing back this kind of literature to the early intercourse of Christian and Moorish nations, but the first work in which we find definite examples of fairy tales is the *Nights* of the Italian novelist Straparola, translated into French in 1585. In this collection are found at least the outlines of some of the best-known stories of the sort, such as *Le Chat Botté* (Puss in Boots), *Prince Marcassin*, *Blanchebelle*, and *Fortunatus*. The immediate forerunner and prototype, however, of the French fairy tales was the *Pentamerone* of Signor Basile, written in the Neapolitan *patois*, and published in 1672. This work attracted and stimulated the fancy of M. Charles Perrault (q.v.), whose *Histoires ou Contes du Temps passé* appeared in 1697, and is incomparably the most naïve and charming of all the collections of fairy tales. The titles of some of his *contes* will recall many a literary feast of our childhood—*La Barbe Bleue* (Bluebeard), *La Belle au Bois Dormant* (The Sleeping Beauty, to which, by the by, Tennyson has given a poetic immortality), *Le Chat Botté* (Puss in Boots), *Riquet à la Houppe* (Riquet with the Tuft), and *Le Petit Chaperon Rouge* (Little Red Riding Hood). The principal successors of Perrault were the comtesse d'Aunoy (see AUNOY), Madame Murat, and Mademosielle de la Force; but their stories are much more extravagant and forced than those of the illustrious academician. The same censure, however, is not applicable to *Les Contes Marines* (1740), by Madame Villeneuve, among which occurs the tale entitled *La Belle et la Bête* (Beauty and the Beast), perhaps the most beautiful creation in the whole circle of this fantastic form of fiction.

Meanwhile, the translation of the *Arabian Nights' Entertainments* (q.v.) by Galland, 1704–17, and of numerous other Arabic and Persian works, the great encouragement extended to the literature of the East in the 17th and 18th centuries, the publication of the *Bibliothèque Orientale* of D'Herbelot, etc., created a taste for the brilliant exaggerations of oriental fiction, and a variety of works were soon in the field, swarming with necromancers, dervishes, caliphs, bashaws, viziers, cadis, eunuchs, slaves. The most notable of these are—*Les Mille et un Quart d'Heure, Contes Tartares; Les Contes Chinois, ou les Aventures Merveilleuses du Mandarin Fum-hoam;* and *Les Sultanes de Guzaratte, Contes Mongols*, of M. Gueulette.—Of the class of fictions known as *Voyages Imaginaires*, the principal are the *Histoire Comique des Estats et Empires de la Lune*, and the *Estats et Empires du Soleil* of Cyrano Bergerac, which materially influenced the genius of Swift, who has, in fact, borrowed not a little from the first of these in his *Gulliver's Travels*, and which were themselves partly suggested by the Spanish romance of Dominico Gonzales, entitled *The Man in the Moon*. Such novels as the *Paul et Virginie* of Bernardin St. Pierre, which appeared towards the end of the 18th c., do not come under any of the four heads, but may most conveniently be mentioned here.

Prose fiction of Germany during the 18th and 19th centuries.—The limits of our space will not permit us to do more than superficially indicate the development of this branch of literature in Germany, which, however, is the less to be regretted, as, during the greater part of the 18th c., it did not attain much distinction. Toward the close of the century, however, writers became more numerous, and as the literary activity of many of them continued on till the first or second quarter of the 19th c., it will be most convenient and natural to treat both centuries together, as they, properly speaking, form only one era in the literary history of that nation.

The first eminent German novelist of this period was Wieland (q.v.), whose Greek romances, *Agathon*, *Aristippus*, *Socrates*, etc., are of that didactic and skeptical character which was beginning to mark the reflective genius of the continent, and which has since produced such immense changes in all departments of thought. Wieland was followed by a crowd of writers, in whose productions is more or less distinctly apparent the influence of the English novelists, particularly of Richardson and Fielding, who had been translated and carefully studied in Germany, where, however, the "novel of manners," whether serious or comic, dealt more largely in the representation of "family life." The principal names are August la Fontaine, Wetzel, Müller (whose *Siegfried von Lindenberg* is still remembered and read), Schulz, and Hippel. Almost contemporary with these quiet and somewhat prosaic novelists, there flourished for a brief period (1780—1800) a school of an entirely opposite character, whose works, fiercely and outrageously romantic, had their poetic counterpart in Schiller's *Robbers*. They resemble, in their style of handling the feudal ages, the English romances of Mrs. Radcliffe and others, which probably suggested them. The chief writers of this "turbulent school of fiction," as it has been called, are Cramer, Spiers, Schlenkert, and Veit Weber.

Alone, and far above all others in redundancy and originality of fancy, humor, and pathos, towers Jean Paul Richter (q.v.), who is incapable of classification, and to whom, therefore, his countrymen have affixed the epithet of *Der Einzige* (The Unique). Apart from all schools—in this respect, but in this only, like Richter—stands Johann Wolfgang Goethe (q.v.), whose novels, as well as his poems, are poetico-philosophic efforts to represent, perhaps to solve, the great facts and problems of human life and destiny.

The reaction from the materialism and irreligious levity of French thought, first showed itself in Germany toward the close of the 18th c., in a certain earnest love and study of the old, simple, superstitious, and poetical beliefs of the middle ages. Hence originated the exquisite class of fictions called *Volksmährchen* (popular legends or tales), in which the Germans have never been equaled. The most illustrious cultivator of this species of fiction is Ludwig Tieck (q.v.), for Musæus (q.v.), though gifted with admirable powers of narration, is marked by a skeptical humor and irony, not altogether compatible with an imaginative conception of his subject. Other distinguished names are those of De la Motte Fouqué (q.v.), Chamisso (q.v.), Heinrich Steffens, Achim von Arnim (q.v.), Clemens Brentano (q.v.), Zschokke, and Hoffman (q.v.). More recent novelists of note are Auerback, Freytag, and Paul Heyse. The tales of Fritz Reuter, written in the *Platt* or Low German, are original and delightful.

NOVELS AND ROMANCES OF THE 19TH CENTURY.—These have been produced in such overwhelming quantity that volumes would be required merely to classify and characterize them. The vast and rapid increase in the material facilities of intercourse among European nations which has taken place during the last 40 years has, among other results, tended to diffuse through each country the literary products of all the others especially those of an entertaining kind; and these have in turn more or less stimulated the imagination of native genius, so that at present there is hardly a people in Europe, not even excluding Turkey, which has not contributed something to the enormous stock of fiction belonging to the 19th century. It would be altogether out of the question to attempt, in a compendious work like the present, a notice, however brief, of the principal novels and romances of every European nation; we can only refer to the historical surveys of literature, to be found under such heads as BELGIUM, BOHEMIA, HUNGARY, NETHERLANDS, NORWAY, POLAND, SWEDEN, TURKEY, etc., and to individual biographies of eminent continental novelists. Even in regard to England and France, we can do little more than catalogue a few prominent names.

1. *English Fiction.*—Almost the first novelist that we encounter in the 19th c., sir Walter Scott (q.v.), is probably the greatest that England, or even the world, has ever seen. Here, however, we have less to do with his personal rank in literature than with the kind of fiction that he cultivated. In a qualified sense, he may be regarded as a continuation of the romantic school, but it must be observed that he is free from all their monstrosities, spasms, tricks, and horrible machinery. Possessed at once of far greater antiquarian learning, imaginative genius, sound sense, and instinctive taste than any of his "romantic" predecessors, he knew precisely what to shun and what to choose; and though his feudal age, as depicted in *Ivanhoe, The Fair Maid of Perth*, etc., is a considerably idealized portrait of the rugged facts, it *is* a portrait, and not like Horace Walpole's and Mrs. Radcliffe's performances, a furious caricature. The political reaction that took place in Britain, after the sanguinary excesses of the French revolution, assuming the form of a new and passionate attachment to venerable and time-honored traditions, showed itself in literature too, and sir Walter Scott was its grandest representative. He strove to delineate the past as it seemed in the eyes of men who were dubious of the present and afraid of the future—noble, stately, glittering, and gay, with the pulse of life ever beating to heroic measures. The overpowering genius of Scott necessarily but unhappily (for the comfort of readers) led to "endless imitation," but the only one of his followers that held for a time a tolerably decent position in literature is G. P. R James (q.v.). Galt (q.v.) and Wilson (q.v.), the former with vulgar but racy humor, the latter with a highly sentimental and overdone pathos, portrayed aspects of Scottish life which the author of *Waverley* has passed over. Other novelists, such as Lockhart (q.v.), Miss Ferrier (q.v.), and Mrs. Johnstone, do not call for special notice; neither does Hope (q.v.), though his *Memoirs of Anastasius* is a most brilliant and powerful book: nor Moore (q.v.), though his *Epicurean* has all the sparkling and superficial splendors of his verse. After Scott, the next novelist who distinctly marks a new stage in the development of fiction is sir Edward Bulwer Lytton (q.v.), in whose earlier works at least we find something like a reflection of the cold, sneering, selfish, and sensual spirit that marked the upper classes during the period of the regency; but the versatile genius of this author, and the different fields in which he has won renown, would make it quite unfair to define him as a merely "fashionable" novelist, though his first and least meritorious distinctions were acquired in that capacity, and students of *Sartor Resartus* are apt to so remember him. Of fashionable novelists, strictly so called, the best-known are Mrs. Gore (q.v.) and Theodore Hook (q.v.). This class was succeeded by another infinitely worse than itself—the *Newgate novelists*, as they have been well termed, who sought for their heroes among highwaymen, thieves, desperadoes, and murderers, like Jack Sheppard, Blueskin, Dick Turpin, Claude Duval, etc., and, flagitiously indifferent alike to fact and morality, labored with pernicious success to invest the lives of these scoundrels with a halo of romantic interest and dignity. The chief of this school, "by merit raised to that bad eminence," is William Harrison Ainsworth (q.v.). During the last 30 years novels have been multiplied to a degree which is almost alarming, and literally incalculable. The greatest names are unquestionably those of Dickens (q.v.), Thackeray (q.v.), and Miss Evans (q.v.); but besides these might be mentioned a host of others, who have attained either celebrity or popularity, or both. Every mode of life, and every kind of opinion, social, artistic, scientific, philosophical, and religious, has sought to recommend itself by adopting this fascinating garb. We have the nautical novels of Marryat (q.v.), redolent, like Dibdin's songs, of the briny deep; the political novels of Disraeli (q.v.); the sporting and military novels of Lever (q.v.); the bril-

liant "muscular Christian" novels of Kingsley (q.v.); the "governess-novels," as they have been aptly denominated, of Miss Brontë (q.v.); the "school" novels of Hughes and Farrar; and the "sensational" novels of Wilkie Collins, Miss Braddon, and others. Other authors not less eminent, but not so easily classified, are Mrs. Gaskell, Mrs. Norton, Miss Mulock (now Mrs. Craik), Mrs. Oliphant (q.v.), Charles Reade (q.v.), George Macdonald; Meredith, Whyte-Melville, M'Carthy, Blackmore, "Ouida," are well known in various departments of fiction; and recently William Black has shown himself an artist of a high class. The extraordinary increase of this potent and therefore perilous branch of literature cannot fail to excite much curious reflection in thoughtful minds.

2. *French Fiction during the* 19*th Century.*—A few words are all that we can devote to this part of our subject, though it is far from uninteresting either in a literary or a moral point of view. The effect of the revolution of 1789 on literature was not immediately beneficial, but the reverse, though it planted the germs of a multitude of new thoughts and aspirations in the mind of Christendom, which have since yielded, both in France and elsewhere, a prolific harvest of wheat and—tares. The iron despotism of Napoleon crushed nearly all literary expression whatever. His hatred of "idealogues" is well known, but the novel was that species of idealogic composition that came least into collision with the principles of imperialism. Even *it*, however, could hardly be said to flourish; and the only tolerably gifted writer of fiction who figures during the first empire is Le Brun, and he was reduced to the necessity of caricaturing the *bourgeoisie*, to which Napoleon had no particular objection, as they were by no means his warmest admirers. Chateaubriand (q.v.) and Mme. de Staël (q.v.) are insignificant in this department, and Charles Nodier, though voluminous, was not an original novelist. After the return of the Bourbons, and especially after the revolution of 1830, France began to display a wonderful literary activity, and in particular, its long-repressed faculty of imagination burst into a sudden blossom of poetry and fiction. Even Napoleon, now that he was dead, received a peculiar homage from the class to whom he had never shown favor or regard, of which the songs of Béranger and *Les Misérables* of Victor Hugo afford us specimens. Unhappily for the purity of its literature, the *régime* of the restoration, which followed the deliverance of France from a military despotism, was itself a base, corrupt, and profligate thing. The Bourbons came back only to re-enact the follies of their ancestors in the previous century, and the nation soon came to despise, detest, and disbelieve them and the church which supported them. Hence a certain reckless levity and hollow mocking laughter, as of heartless skepticism, pervading those fictions which profess to delineate the realities of current life. Moreover, the sparkling wit, the sunny humor, the pathos, often exquisitely tender and refined, the delicate or deep delineation of character, the occasional fine flush of sentimental enthusiasm, and the poetic witchery of a religious mysticism, cannot blind us to the fact that the substance of most of the recent French fictions is incurably immoral. Paul de Kock (q.v.), Balzac (q.v,), Dumas (q.v.), father and son, Sue (q.v.), Dudevant (q.v.), Daudet, Zola, though wholly dissimilar in the quality of their genius, are in this respect too wofully alike. Victor Hugo (q.v.) and Lamartine (q.v.) are indeed morally far above the rest of their contemporaries, but they are perhaps the only great exceptions that can be mentioned. The "second empire" did not improve the tone of the French novel, any more than it improved the tone of French society; but if it be true that when things have reached their worst they begin to mend, the country that has produced *La Dame aux Camelias* is perhaps, as regards the literature of fiction, in a hopeful condition. The Erckmann-Chatrian tales, graphic delineations of provincial life, are honorably distinguished by the absence of all indecency. Verne's tales of impossible semi-scientific voyages to the moon and elsewhere are unique.

The prose fiction of Spain and Italy during the 19th c. scarcely requires notice, as the former country has not produced a single work that has forced its way into the general European market, while the latter can boast of only one that has attained that dignity, the *Promessi Sposi* of Manzoni (q.v.); but in a comprehensive sketch like the present, it would be a blemish to omit at least the names of the more eminent transatlantic novelists, as they have contributed not a little of late years to the stock of English prose fiction. The most notable are Brockden Brown (q.v.), the American Godwin; Fenimore Cooper (q.v.), from whom Europe has been content, on the whole not unwisely, to take its notions of the forests, the prairies, and the red men of the west; Washington Irving (q.v.), Edgar Allan Poe (q.v.), Nathaniel Hawthorne (q.v.), Mrs. Beecher Stowe (q.v.), Oliver Wendell Holmes (q.v.), and Brete Harte, in all of whose writings, except in the tales of Poe, is visible the influence of the life, traditions, scenery, and other salient characteristics of the new world. See Dunlop's *History of Fiction* (Lon. 1814), and Wolff's *Allgemeine Geschichte des Romans* (Jena, 1841, 2d edit. 1850).

NOVEMBER (Lat. *novem*, nine) was among the Romans the 9th month of the year, at the time when the year consisted of 10 months; and then contained 30 days. It subsequently was made to contain only 29, but Julius Cæsar gave it 31; and in the reign of Augustus the number was restored to 30, which number it has since retained. November was one of the most important months in connection with the religious ritual of the Romans, and continues in the same position, though for other reasons, in the Roman Catholic ritual. It was known among the Saxons as *Blot-monath*, "blood-month," on account of the general slaughter of cattle at this time, for winter provision (known for a long time afterwards as *Martinmas beef*) and for sacrifice. This custom was not confined to the Saxons, but prevailed in northern Germany, and even as far south as Spain.

NOVGOROD', a government of great Russia, extends immediately s.e. of the government of St. Petersburg. Area, 48,780 sq. m.; pop. '70, 1,011,445. The surface is gently undulating, with the Valdai hills in the south, which rise to about 300 ft., and may be said to form the water-shed between the Baltic, Caspian, and White seas. The government contains many lakes and rivers; of the former, the lakes Ilmen and Bieloe are the largest; and of the latter, the Wolchof, Msta, Szeksna, and Mologa are the most important. The rivers are connected by canals, which are of great service to trade. The soil, especially in the n.e., is not fertile, and the climate is severe; agriculture and cattle-rearing are carried on only to a limited extent. Forests and pasture-lands are numerous and extensive, and the timber and hay sent to the capital realize a considerable income. Quarries of the best stone for paving occur on the river Tosna, and near Stara-Russa there are mineral and saline springs.

NOVGOROD, an important t. of European Russia, capital of the government of the same name, is situated on the Volkhof, near where it issues from lake Ilmen, 122 m. s.s.e. of St. Petersburg. It is the cradle of Russian history. In 862 the Norman prince Rurik, of the tribe of Variago-Ross (whence the name *Russia*), was invited hither by the neighboring tribes, and from him begins the history of the country, and the line of its sovereigns. A monument, commemorative of this event, was erected here, with great pomp, in Sept. 1862. In the 9th c. Oleg, the successor of Rurik, transported the capital to Kief; but bestowed many privileges and liberties upon Novgorod, and from that time it began to prosper. The greatness of Novgorod provoked the jealousy of the princes of Moscow, and in 1471 the czar Ivan III. nearly destroyed the town, bereft it of its liberties, and exiled the most influential citizens. During the time of its prosperity, the town was called Novgorod the Great; and had 400,000 inhabitants, and extended its sway to the White sea and the river Petchora. Its government was a sort of republic, the prince being less a sovereign than the chief commander of the troops. Its greatness was due to its vast foreign trade alone, and when Archangel was opened for English trading vessels, but especially after the foundation of St. Petersburg, its trade fell away, and the town rapidly declined. Of the existing ancient buildings, the most remarkable are the church of St. Sophia, founded in the 11th c., possessing a fine old library, as well as some remarkable paintings and tombs; and the Kreml, in the steeple of which hung the famous bell used to summon the citizens for the deliberation of state affairs. Pop. '67, 16,722.

NOVGOROD-SSJEWERSK, or NOVGOROD-SEVERSKO'IE, a t. of Russia, in the province of Tchernigov, 89 m. n.e. from Tchernigov, on the right bank of the Desna, a branch of the Dnieper. It is the capital of a district, and is a place of considerable trade and activity. Pop. '67, 6,801.

NOVGRAD'-VOLYNSKI', a t. of European Russia, in the government of Volhynia, 52 m. w.n.w. from Jitomir. It is the capital of a circle, and is situated on the banks of the Slutch, a feeder of the Pripet, and so of the Dnieper. Pop. '67, 8,068.

NO'VI, a t. of northern Italy, in the province of Genoa, is a station on the railway from Turin to Genoa, and is 38 m. n.n.w. of the latter city. It presents few attractions, with the exception of a number of picturesque old houses. It carries on a considerable transit trade; and the silk produced in the vicinity is amongst the most celebrated in Italy. Pop. 11,445.

NO'VIBAZAR', also JENIBAZAR, a t. of Bosnia, European Turkey, situated on the river Rashka, an affluent of the Morava, 130 m. s.e. of Bosna-Serai. Several of the great roads of the country cross each other here. Novibazar has celebrated fairs, important trade, and considerable wealth, but the houses are mostly of mud. It is the chief point of communication between Bosnia and the rest of Turkey. Pop. estimated at 15,000.

NOVICE. See NOVITIATE, *ante.*

NOVIKOFF, NIKOLAI IVANOVITCH, 1744-1818; b. Russia; entered the government service at the age of 18, but soon retired to devote himself to literature. One of his first publications was *The Painter*, containing satirical sketches of manners somewhat after the fashion of the *Spectator*. This was followed by his *Specimen of a Lexicon of Russian Authors*. These works won him the favor of the empress Catharine II., and he removed to Moscow, where he founded a typographical society, for the purpose of printing cheap books. He organized the first circulating library in Russia, but was obliged to leave Moscow, as a supposed adherent of the French philosophers. He published 1773-75 a collection of historical materials, called *The Old Russian Library*.

NOVITIATE, the time of probation, as well as preparatory training, which in all religious orders precedes the solemn PROFESSION (q.v.). Under the head of MONACHISM will be found the general principles by which the training for the "religious" life is regulated. It will be enough to say here, that the novitiate in all orders must continue (Conc. Trid. Sess. xxv. c. 85, *De Regul. and Mon.*) at least one year. In most orders it is of two, and in several of three. Any attempt to solemnize the profession before the expiration of the noviate, without a dispensation, is invalid. During the novitiate, the novices are immediately subject to a superior, called master (or mistress) of novices. They are not permitted to engage in systematic study, their whole time being devoted to prayer, and to ascetic and liturgical training. During the novitiate, the novice continues free to withdraw, nor is he or she admitted to profession at the close of the novitiate, except after proof given of fitness, and of proper dispositions for the particular institute aspired to.

NOVOARKHANGHELSK' (New Archangel), or SITKA, a seaport of Alaska, formerly center of the administration of the Russo-American company, situated on the island of Sitka, on the n.w. coast of the American continent, in lat. 57° 3′ n., long. about 135° west. It has a good port, and was the entrepôt of all the stores for the other Russo-American colonies, and of their produce, of which furs were the principal item. There are at Novoarkhanghelsk only 66 clear days in the year. Mean temperature throughout the year, 43° 45′ F. Pop. (before cession of Alaska to the U.S.) 1,000, mostly servants of the company.

NOVO GEORG'IEVSKI, a t. in Russian Poland, at the junction of the Bug and Vistula rivers, 19 m. n.w. of Warsaw; pop. 10,225. It was founded in 1809, by Napoleon, who gave the name of Modlin, which was changed to the present name by the Russians, when they gained possession of it after the fall of Warsaw in 1831. It had also been in the hands of the Russians, 1813–30, when the Polish revolutionists seized it. It is a strongly fortified post, with an arsenal and citadel.

NOVOMOSKOVSK', an important market-t. of s. Russia, in the government of Ekaterinoslav, and 20 m. n.n.e. of the town of that name, on the Samara, an affluent of the Dnieper. Three extensive fairs, chiefly for the sale of cattle and horses, are held here annually. The "remounting" officers attend these fairs for the purpose of supplying their regiments with horses. Tanning and tallow-melting are carried on. Pop. '67, 10,379.

NOVOTCHERKASK', a t. of s. Russia, capital of the territory of the Cossacks of the Don, on the Aksai, a tributary of the Don, at a distance of 12 m. from its right bank, and about 70 m. e.n.e. of Taganrog. The central administration of the territory was transferred hither from Tcherkask in 1804 by count Platoff, commander-in-chief of the Cossacks. The choice was not a happy one, the distance of the town from the Don, the great commercial artery, being much felt. In 1855, a statue was erected in memory of count Platoff, who achieved an illustrious name by his military exploits from 1770 till 1816, and especially during the French invasion in 1812. Pop. '67, 27,918, who carry on trade and manufactures, agriculture, cattle-breeding, fishing, and wine-growing.

NO'VUM ORGANUM, or The New Instrument, lord Bacon's treatise sketching the inductive method of studying nature, which before his time had been pursued only occasionally and blindly—a method whose introduction divides philosophy into the old and the new. I. Bacon in the first part of his work surveys the imperfections of human knowledge. 1. He notes the vagueness and uncertainty of all speculation, and the want of connection between the sciences and the arts, due to "the perverseness and insufficiency of the methods pursued." "If men had consulted experience and observation, they would have had facts, and not opinions, to reason about." The method then in vogue he describes as "ill-suited to discovery, but wonderfully accommodated to debate." 2. He enumerates the causes of error, naming them in the figurative language so commonly employed by him—*idols*, things to which the mind had long been accustomed to bow down; of these he shows four classes: (1.) Idols of the *tribe* or of the race: causes of error found in human nature in general; such as man's propensity to find in nature a greater degree of order and regularity than actually exists. Thus, as soon as men perceived that the orbits of the planets were returning curves, they assumed them to be perfect circles, and the motion in them to be uniform; and to these false suppositions the ancient astronomers labored to reconcile the facts which they observed. (2.) Idols of the *den*: causes of error springing from individual character, as if each person had his own cavern or den, into which light imperfectly enters; some minds being best fitted to mark differences, others resemblances, etc. (3.) Idols of the *forum*: causes of error arising out of public and social intercourse, and especially out of its implement—language. Men believe that their thoughts govern words; while often their words govern their thoughts, and few abstract terms convey precise and well-defined ideas. (4). Idols of the *theater*: causes of error arising from the systems or doctrines of particular schools, which are like imaginary worlds brought upon the stage, yet influencing the mind as if they were real. 3. Bacon, pointing out the circumstances which had favored these perverse methods, (1) notes three periods of pursuit of science—the Grecian, Roman, and European—after the revival of letters: the first, short; the second, disturbed in its earlier part by politics and war, and, after the rise of Christianity, by religious interests and theological pursuits; the third, overshadowed by royal and hierarchical power enslaving the mind. In his opinion no part of knowledge could make much progress if its start was not made from facts in nature. (2.) He shows that the end and object of knowledge had been misunderstood; that some had pursued the knowledge of words rather than of things; some, of objects imaginary and unattainable, promising to prolong life indefinitely, to extinguish disease, and to rule the spiritual world by magical charms. "All this is the mere boasting of ignorance; for, when the knowledge of nature shall be rightly pursued, it will lead to discoveries that will as far excel the pretended powers of magic, as the real exploits of Cæsar and Alexander exceed the fabulous adventures of Arthur of Britain or Amadis of Gaul." (3.) Reverence for antiquity and the authority of great names had greatly retarded the progress of knowledge: the "older times" were really the young and inexperienced times; the latest age is the oldest; having gathered the most of facts and experiences. (4.) Knowledge has been greatly hindered by the fact that in general men have inquired only into the causes of rare and great phenomena, without troubling themselves about the explanation of such as are common, and make a part of the general course of nature; while the laws always in action are those which it is most important to understand. It was an error of the same sort which had led men to delight in mere contemplation and to regard manual experiment as beneath the dignity of science.

II. The second book of the *Novum Organum* treats of the induction essential to the right interpretation of nature. 1. A history full and accurate of the phenomena concerned must be prepared—a "natural history." 2. There must be a comparison of the various facts to find out the cause of a phenomenon—its "form or essence;" also, to discover the invisible processes and the invisible structure of the bodies concerned. 3. The facts being in hand, consideration is then to be had of them as to what things are by these facts excluded from the number of possible causes. After many such exclusions have left but a few principles common to every case, one of these is to be assumed as the cause, and the trial is to be made by synthetical reasoning whether it will account for the phenomenon. This process by exclusion—through successive negatives to the final affirmative—Bacon regarded as essential to success. 4. This method of induction he declared to be applicable to all investigations where experience is the guide, whether in the physical or moral world.

NOWANAGAR, or NOWANUGGUR, a seaport of India, in the peninsula of Kattywar, Guzerat, at the mouth of the Nagna, a small river on the s. shore of the gulf of Cutch, 160 m. w.s.w. from Ahmedabad, and in n. lat. 22° 28′, e. long. 70° 11′. It is the principal place of the district of Hallar, the greater part of which is held as a *jaghire* by the chief of Nowanagar, who bears the title of the jam of Nowanagar. His territory comprises 540 villages, and a pop. of about 290,000. The town of Nowanagar is large and populous, nearly 4. m. in circuit. It is a place of very active trade, famous for the fine quality of the cloth which it produces, and for the brilliant colors of which its fabrics are dyed. In the adjacent sea are beds of pearl oysters. Copper ore has been discovered in a range of hills behind the town.

NOWELL, INCREASE, 1590–1655; b. England; having been chosen an assistant of the proposed colony of Massachusetts bay, upon the formation of the company he came to this country with Winthrop in 1630, and became an elder in the rev. John Wilson's church. He was commissioner of military affairs during the first Pequot war in 1634, and secretary of the colony, 1636–49.

NOX, in mythology, daughter of Chaos and mother, by her brother Erebus, of Æther (the air) and Hemera (day). She was also the mother of the Fates, of Death, Dreams, Nemesis, Fraud, the Hesperides, etc. The victims sacrificed to her were a black sheep and a cock. The poets called her mother of all things, and Homer represents Zeus as standing in fear of her. There was a famous statue of her by Rhoecus in the temple of Diana at Ephesus, and her attributes seem to have been blended with those of the moon goddess. She is represented as riding in a chariot with the constellations going before her, and wearing a starry veil, or with two children in her arms, one black representing death, one white representing sleep, or as riding in a chariot drawn by bats and owls, and dressed in mourning, with a crown of poppies on her head.

NOXUBEE, a co. in e. central Mississippi, bordering on Alabama; intersected by the Tombigbee and its branch the Noxubee, rivers, and by the Mobile and Ohio railroad; about 650 sq.m.; pop. '80, 29,874—29,784 of American birth, 24,574 colored. The surface is level, with extensive forests, including, besides many hard-wood trees, the cypress, magnolia, and tulip trees. The soil is very rich. Indian corn, cotton, and pork are staples. Co. seat, Macon.

NOYADES (i.e., "drownings," from Fr. *noyer*, to drown), the execution of political offenders in great numbers at once by drowning them, one of the atrocities of the French revolution, practiced at Nantes by Carrier, the deputy of the convention. See CARRIER. This mode of execution was also called, in cruel sport, *vertical deportation*.

NOYAU. See LIQUEUR.

NOYES, ELI, D.D., 1814–54, b. Me. He was self-educated, and began to preach in 1834; he embarked with his wife, Sept. 22, 1835, for Calcutta, and settled at Orissa, where he had great success in mission work. In 1841 he returned with impaired health, and for several years was pastor of a Free-will Baptist church, in Boston. He edited for 10 years the *Morning Star*, the Free-will Baptist organ. He published *Lectures on the Truths of the Bible; A Hebrew Grammar and Reader.*

NOYES, George Rapall, d.d., 1798–1868; b. Mass; graduated at Harvard college in 1818, and afterwards at the Harvard divinity school. In 1827 he was settled over a Unitarian church in Brookfield, Mass., from which he removed to a church in Petersham. During this time he pursued the study of the biblical text in the original languages, and was recognized as one of the first Hebrew scholars in America. In 1840 he was appointed Hancock professor of the oriental languages in Harvard college, and Dexter lecturer on biblical literature. He published in 1827 *An Amended Version of the Book of Job; A New Translation of the Hebrew Prophets*, 1833–37; *A New Translation of the Prophets, Ecclesiastes, and the Canticles*, 1846; *Theological Essays*, 1856; and a *Translation of the New Testament*, issued by the American Unitarian association in 1869.

NOYES, John Humphrey, b. Vt., 1811; graduated at Dartmouth college; studied theology at Andover and New Haven; was licensed to preach in 1833. In 1834, announcing himself a Perfectionist, his license to preach was recalled, and he began to propagate his new views in various periodicals. He has published several volumes, the most important of which are *The Berean; The Second Coming of Christ; Salvation from Sin; Bible Communism; Male Continence and Scientific Propagation; History of American Socialisms.* In 1838 he founded a community of Perfectionists at Putney, Vt.; removed in 1847 to Lenox, Madison co., N. Y., and established the Oneida Community. He afterwards established another branch at Wallingford, Conn. The Perfectionists practice community of women as well as of goods, and maintain the full equality of the sexes in social and business life. They are profitably engaged in farming and manufactures, and have two printing-offices. Recently the public indignation against the sexual immorality of their system has taken such stern expression and such legal attitude that the practical abandonment of their indecent theories has been announced. Noyes is a man of fascinating manners and fine literary taste.

NOYES, William Curtis, ll.d., 1805–64; b. Shodack, N. Y.; began the practice of law in 1827 in Oneida co., where he quickly took high rank. He removed to New York in 1838, and immediately took a place among eminent lawyers, and was at one time engaged to codify the laws of the state. In politics he was an antislavery whig. And on the organization of the republican party became a member of it; but was drawn into the futile and temporizing peace convention of 1861. He was elected president of the New England society the day before his death, which took place in New York, Dec. 25, 1864. He bequeated a valuable law library to Hamilton college.

NOYON, a t. of France in the department of Oise, 78 m. n.n.e. of Paris by the Northern railway. It has a fine cathedral of the 12th and 13th centuries, in the Romanesque style of architecture; an episcopal palace, and some linen and cotton manufactures; Pop. '76, 5,785. Noyon was a residence of Charlemagne, and the place where Hugo Capet was crowned king of France in 987. It is also noted as the birthplace of John Calvin.

NU'BIA. the modern appellation of a country subject to the khedive of Egypt, extending from Philae to the Sennaar, lat. 18° s., bounded on the e. by the Arabian gulf, n. by Egypt, s. by Abyssinia, and on the w. by the desert. It appears to have been anciently known as Ethiopia. The ancients gave the name of Ethiopia to the w. bank of the Nile from Meroë to the bend of the river. The name seems to have been derived from the Egyptian and Coptic *noub*, or gold, a name still retained in *Wady Nouba*, which extends from the frontier of Dongola, n. of the *Wady Seboua*, above Derri. The tract between Seboua and Assouan is called the Wady Kenous. Diocletian removed hither a Libyan tribe, called Nobatæ, to the district above Syene, to oppose the Blemmyes, who inhabited the western desert, now held by the Ababde and Bisharein Arabs. The dominion of the Pharaohs, when most extended, reached to the isle of Argo, the last place where the monuments of the Egyptians have been found. Under these monarchs it was called Cush, and was governed by a royal scribe, entitled prince of Cush or Ethiopia, till the twentieth dynasty, when it appears to have been recovered by a series of native rulers, who ultimately conquered Egypt; and although driven back, finally extended their rule from Meroë to Syene, the most southern city held by the Egyptian monarchs, the Ptolemies, and the Romans. These Ethiopians adopted the civilization of the Egyptians, and the names of some of their monarchs have been preserved. The subsequent fortunes of this country will be seen under Ethiopia. The modern inhabitants consist principally of Arabs, who invaded the country after the rise of Mohammed, the principal tribes being the Djowabere and El Gharbye, who inhabit from Assouan to the Wady Halfa; the Kenous, Djaafere, and others, a branch of the Koreish, who occupied the land from Esne to Assouan. By the aid of Bosnian soldiers the Djowabere were driven into Dongola in the reign of Selim; and their descendants still flourish at Ibrim, Assouan and Sai. Lower down inhabit a race called the Berbers or Barabras; s. of Cossier are the Ababde. From Dongola and Sennaar, a negro state, the people are called Noubas, a hardy race, differing from the pure blacks; but the country throughout is inhabited by mixed races of Arabian and Nigritic blood. Another tribe, the Sheygya, e. of Dongola—a fine black race, addicted to horsemanship and war—are still more interesting. The Ababde Arabs are renowned as guides and camel drivers; the Bisharein are supposed by some to be the ancient Blemmyes, a tribe living on flesh and milk, but without the oriental jealousy of the Arabs; the Takas, supposed to be the ancient Bojahs, dwell in the mountains. Three principal languages are spoken by these various tribes—the Nuba by the Berbers, who entered from the s.w.; the Kungara, a Nigritic dialect, by the negroes of Dafur; and the Bisharie, said to exhibit Aryan affinities. The inhabitants, estimated at about 1,000,000, although less in stature than the Egyptians, are a fine muscular race; the women are pleasing, but not beautiful; and the climate is remarkably healthy. In their political government they were governed by their own chiefs, *maks* or *malechs*, till they were subdued by Ismael Pasha, in 1820, to the sway of Egypt, and the civil government is now administered by the Turks. The country is arid, in many places only cultivable at the sides of the Nile, and consists of granite and sandstone. The soil raises durra, cotton, and date palms. It is traversed by the *Bahr-el-Azrek*, or Blue Nile, and the *Bahr-el-Abiad*, or White Nile. The products are numerous, comprising maize, dates, tamarinds, gums, aloes, civet, musk, wax, myrrh, frankincense, senna, black wool, hides both of the elephant and rhinoceros, and their ivory; ostrich feathers, ebony, gold dust, saltpeter, salt, tobacco, coffee, cotton—which are carried by way of commerce to Egypt. The taxes are rated by the number of water wheels for the irrigation of the land. There being no native currency, the coins of Egypt and Europe, especially the Spanish dollar, are received, but glass beads, coral, cloth, *tobs* or shirts, and cloth (*samoor*) also pass as money. In Kordofan value is reckoned by cows. The most primitive modes of measurement are in use, maize being sold by the handful (*selga*), 18 of which go to a *moud;* and cloth being measured from the elbow to the fingers. Polygamy is general, and a wife at Kenous is purchased of her parents for 30 piastres; amongst the Arabs for 6 camels, 3 of which are returned to the bridegroom. Some of the tribes are jealous of their women, who are celebrated by travelers on account of their virtue. In their costume they use turbans, linen, and woolen garments, and are armed with lance and shield, the latter made of the hide of the hippopotamus. No looms exist, but they plait neatly. Their chief musical instrument is a guitar of five strings with sounding-board of a gazelle's hide. They are generally averse to commerce, eat little animal food, and are Mohammedans. Their houses are low huts of mud or stone. The chief attraction of this country to travelers is the numerous temples and other ancient remains of the Egyptians, extending from Philae to the island of Argo. These consist of the temple of Isis, in the isle of Philae, founded by Nectanebo, I., and continued by the Ptolemies; the temple of Deboud, built in honor of Amen Ra, by Ataramen, and continued by the Romans; Tafa or Taphis, the modern Kalabshe, built by Rameses II.; the rock temple of Beit e Welly, recording the conquests of the same monarch; Wady Halfa, built by Osertesen I.; the rock temple of Ibsamboul, built by Rameses II.; Gebel Addeh, built by Horus of the eighteenth dynasty; Ibrim, built by Amenophes II.; Amada, founded by Thothmes III.; Ghersheh, Seboua, and Derri, built by Rameses II.; Dakkeh, the ancient Pselcis, built by Ergamenes; and the colossus of the isle of Argo; the pyramids of Meroë and Tanquassi.—Burckhardt, *Travels;* Champollion le Jeune, *Lettres Ecrites*, p. 107, and foll.; Lepsius, *Reise*, p. 107, and foll.

ÑUBLE, a small inland department of Chili on the w. slope of the Andes, bounded n. by the river Maule, e. by the Andes, s. by the Nuble river, which flows into the Itata, and w. by the department of Maule, which lies between it and the Pacific; 3,700 sq.m.; pop. 128,182. It is one of the most fertile and prolific parts of Chili. Its climate is suited to grain, to the fruits of the temperate zone, to the vine for wine-making, and to grazing and the rearing of horses. Capital, Chillau.

NU'CHA or **NUKHA**, a t. of Russia; after Tiflis and Shemacha, the most important town of Transcaucasia, and the only town of the former khanat of Nucha or Sheki, in the n.w. of Shirwan. It is 120 m. e.s.e. from Tiflis, and stands at the southern base of Caucasus in the valley of the Kish-Tshai, an affluent of the Alasan, which itself is a branch of the Kur. Pop. '67, 23,371. The town is surrounded by mulberry groves and fruit gardens, extending to a distance of several miles. It has long been famous for the rearing of silk worms, silk spinning, and the manufacture of silken goods.

NUCKOLLS, a co. in s. Nebraska, adjoining Kansas, drained by the Little Blue and Republican rivers; 576 sq.m.; pop. '80, 4,235—3,779 of American birth. The surface is mostly prairie, with little timber. It produces good crops of grass, and is suitable for agriculture or grazing. Co. seat, Nelson.

NUCLEOBRANCHIA'TA, or HETEROPODA, an order of gasteropods having the sexes distinct; the locomotive organ fin-like, single, and ventral; the gills packed in small compass along with the heart. They are all marine, and usually swim with the back downwards and the fin-shaped foot upwards. They adhere to sea-weeds by a small sucker placed on the fin. Some of them, as *Atlanta*, have a shell large enough to protect the body; some, as *Carinaria*, have a small shell covering the gills and heart only; and some, as *Firola*, have no shell at all.

NU'CLEUS. See CELLS.

NUDIBRANCHIA'TA (naked-gilled), an order of gasteropods, hermaphrodite, destitute of shell, and having the gills exposed on the surface of the body. The gills are differently situated in different genera. The genus *Doris* (q.v.) is an example of this order.

NUE'CES, a river of Texas, rises in south-western Texas, lat. 30°, long. 101° w., and after a south-easterly course of 300 m., flows into Corpus Christi bay, and through the pass of the same name into the gulf of Mexico.

NUE'CES, a co. in s. Texas, on the gulf of Mexico, s. of the Nueces river, drained by the Santa Gertrudis river and others; 2,800 sq.m.; pop. '80, 7,669—4,410 of American birth, 628 colored. The surface is mostly level, and the soil a rich loam. There is not sufficient rain for agriculture, but the county is admirably adapted for cattle and sheep raising. Large quantities of wool are produced. Corpus Christi bay on the n.e., and numerous other inlets afford good fishing. Co. seat, Corpus Christi.

NUEVA SPARTA. See MARGARITA, *ante*.

NUEVO LEON, a Mexican state bounded n. by the Rio Grande, e. by Tamaulipas, s. by San Luis Potosi and Zacatecas, and w. by Coahuila; between 24° and 27° 30' n. lat., and 99° and 100° 40' w. long.; about 20,000 sq.m.; pop. about 180,000. The surface is irregular and mountainous, and in the s. is made up of table-lands. The chief rivers are the Tigre and other branches of the Rio Grande. In the valleys are extensive forest and pasture lands, as well as good soil for cultivation. The soil would be very fertile were it well watered; maize (three crops), sugar cane, and wheat are the staples. There are mines of gold, silver, lead, copper, iron, and salt, but none fully developed. Marble, alabaster, and sulphur are also found. There are large manufactories of boots, shoes, leather, hats, and cotton cloth. The climate is hot and unhealthy, except in the higher districts. Nuevo Leon is divided into nine districts: Monterey, Cadereita, Villaldama, Salinas, Garcia, Victoria, Morelos, Doctor Arroyo, Linares, and Cerralvo. The capital is Monterey; Florida, Saltillo, Morelos, and Linares are important towns.

NUGGI'NA, a t. of British India, in the district of Bijnur, division of Rohilcund, n.w. provinces. It is 48 m. n.n.w. from Moradabad, on the route from Moradabad to Hurdwar. Nuggina is the Birmingham of upper India, and is famous in modern times for the manufacture not only of gun-barrels but of percussion-locks. Pop. '72, 19,696.

NULLIFICATION, in American politics, the doctrine of the extreme states' rights party, of the right of a state to declare a law of congress unconstitutional and void, and if the federal government attempted to enforce it to withdraw from the union. In 1832, during the presidency of gen. Jackson (q.v.), the free trade and states' rights party in South Carolina (q.v.), under the leadership of John C. Calhoun (q.v.), her senator in congress, asserted the doctrine of nullification in a state convention which declared the tariff acts of that year unconstitutional, and therefore null and void; that the duties should not be paid; and that any attempt on the part of the general government to enforce their payment would cause the withdrawal of South Carolina from the union, and the establishment of an independent government. President Jackson met this declaration with a vigorous proclamation, in which he declared that the laws must be executed, and that "the union must and shall be preserved." South Carolina, standing alone, receded from her position under protest, and a "compromise bill," introduced by Henry Clay (q.v.) in 1833, providing for a gradual reduction of duties, for the time settled the controversy.

NULLIFICATION (*ante*), in general, might be used to indicate any act of absolute invalidation or making void, but is almost exclusively applied to the doctrine first set forth by John C. Calhoun in a paper known as the *South Carolina Exposition*, which was presented by him in 1828 to the legislature of that state, and by them ordered printed. This doctrine asserted the right of any state to declare the unconstitutionality of any United States law, though it should have been passed in the proper manner, have received the assent of the president, and even have been tested as to its constitutionality before the U.S. supreme court. And it was further claimed that any attempt to enforce such law in a state which had refused to acknowledge its force was such an unconstitutional violation of the sovereign rights of that state as would justify her in at once leaving the union. The immediate cause of this remarkable assertion of power was the existing system of tariff laws, which, it was claimed, bore with great unfairness on the non-manufacturing and raw-material-producing southern states. The argument was in great measure based on language used by Jefferson in drawing up the Kentucky and Virginia resolutions of 1798-99 in regard to the sedition and alien laws. Here it was asserted that the general government was not "the final or exclusive judge of the extent of the powers delegated to itself, but that, as in all other cases of compact among powers having no common judge, each party has an equal right to judge for itself, as well of infractions as of the mode and measure of redress." These resolutions further express the conviction that other states "returning to their natural rights in cases not made federal, will concur in declaring such laws void and of no force, and will each take measures of its own in providing that neither these acts nor any others of the general government not plainly and intentionally authorized by the constitution, shall be exercised within their respective territories." Senator Hayne of South Carolina was the first to advocate openly the destructive doctrine based on these expressions of Jefferson, and his speech on the subject in the senate called forth Webster's famous oration of Jan. 26, 1830. The theory rapidly gained ground among the extreme believers in state sovereignty, and toward the close of 1832 the governor of South Carolina, acting on the advice of Calhoun, summoned a convention to meet at Charleston. This convention reported for the action of the legislature an ordinance, declaring that the existing tariff law was "null and void, and no law," authorizing the citizens of the state to refuse payment of any taxes under that law after Feb. 1, 1832, and denying the right of the U. S. supreme court to pass upon the validity of the ordinance itself. This bold declaration of independence from the authority of the general government was accompanied by the threat that if any steps were taken to enforce the collection of duties, the state would be justified in retiring from the union, and not a vote was cast against it in the convention. When congress met in 1832, Hayne was governor of South Carolina. Calhoun entered the senate, and the state legislature was on the point of enacting laws to carry out the nullification ordinance. The danger was averted partly by the adoption of the so-called Clay's compromise, a modification of the tariff law, but chiefly by the firm and wise action of Andrew Jackson, then serving his second term as president. His orders to the revenue officers of Charleston showed his intention to carry out the laws and maintain the authority of the general government; it was well known that he was not a man to be trifled with or intimidated, and his special message to congress on the subject is one of the ablest state-papers produced in the country's history. The authorship of the proclamation is generally attributed to Edward Livingston, the secretary of state. Jackson's position as a southern democrat and as a military hero also had much weight. Calhoun made an able and ingenious speech in the senate, Feb., 1833, sustaining his view of nullification, but the movement had lost its force, and though there was for some years a party of nullifiers under Calhoun's leadership, that form of the doctrine of state sovereignty was no longer a factor in politics, though undoubtedly the forerunner and logical parent of the doctrine of the right of secession.

NUISANCE is a legal term used to denote whatever is an annoyance to one's neighbors, or in a general sense to the public at large, in the exercise of their rights of property. The whole doctrine of nuisance is founded on the theory that every person is entitled to have the full use and enjoyment of his property, and of the right of passing to and fro on the highway without being interfered with or impeded by others, and whatever so impedes this full enjoyment of one's property and right of passage on the highway is a nuisance. Nuisances are thus capable of being divided into two kinds—private and public. Thus, if a neighbor leave a heap of rubbish emitting noxious smells close to A's windows, or make loud noises in his house, these may be said to be private nuisances, for they annoy A in the enjoyment of the fresh air and quiet which are part of his right of property. On the other hand, if something is put of the same kind on a public highway, or so as to annoy divers people equally and in the same manner, then it is called a public nuisance. One of the leading incidents of a nuisance is that the party annoyed by it can in many cases, especially where the nuisance is injurious to health or life, take the law into his own hands and abate the nuisance without resorting to a court of law. The reason is that the matter is of too urgent importance to await the slow progress of a suit at law, and mischief may be done in the mean time which would be often irreparable owing to the delay. Another important qualification of the right of abating a nuisance is that the nuisance must be such that unless it is abated at once the party cannot exercise his legal rights; and hence if the nuisance is of such a kind that it does not directly interfere with the comfort or enjoyment of one's legal rights at the time, he has no right to abate it, but in that case is bound to resort to a court of law. This is best illustrated in the case of a nuisance on the highway, which is the class of cases in which the phrase a common nuisance is most familiarly known. Thus if while A is riding or driving along the highway his progress is interrupted by a fence or gate which nobody has a legal right to put there, it is obvious that unless A can knock down or demolish at once this obstruction he cannot proceed in the exercise of his legal right of using the highway. In such a case he has a right to demolish the gate and abate the nuisance, for it directly interferes with his own legal right. But if instead, a gate, a booth, or tent had been erected, not across the highway, but merely on one side of it, so as to leave room for passengers to pass, then, though such tent or booth would be as undoubted a nuisance as in the other case, yet inasmuch as A can pass without direct interference, he has no right to abate the nuisance by destroying the tent. He must, in this latter case, resort to the legal remedy only. The same rule applies to all kinds of nuisances.

Another rule is that in abating a nuisance the party is not to do unnecessary damage to property, i.e., more than simply abate the nuisance to such an extent as to enable himself to exercise his legal right, and no further. If he go beyond the immediate occasion, and cause unnecessary destruction to property, then he subjects himself to an action of damages. Hence it is often a difficult thing to know when one is justified in abating a nuisance and taking the law into his own hands.

Where the nuisance is sought to be removed by legal means, then the remedy is in some cases two-fold, and in some cases not so. Where the nuisance is of a private nature, an action of damages is in general the only remedy given by the common law. But where the nuisance is public, and affects all the public equally, or nearly so, then in general either an action may be brought, or an indictment will lie. Thus in case of a nuisance on a highway, as this affects all the lieges alike, an indictment is the proper remedy, though if an individual suffered special damage over and above what he suffers as one of the public, then he may bring an action. In Scotland, instead of an indictment, an action in the nature of a public action is raised, which is substantially similar in its results to an indictment.

As will be seen from what has preceded, the legal remedy in cases of nuisances has long been felt to be insufficient. To add to the other defects, there is great difficulty in determining whether a particular mode of using one's premises is in the nature of a nuisance or not; for if the line is drawn too narrowly, the rights of property and the natural freedom of the subject may be interfered with. On the other hand, things which formerly were considered no nuisances are now treated as such, owing to the spread of more enlightened views of public health and habits of cleanliness. These considerations recently induced the legislature to alter the common law in an important degree, and substitute a new code under the name of the public health and nuisances removal acts, 11 and 12 Vict. c. 63; 18 and 19 Vict. c. 116; 35 and 36 Vict. c. 79. The general scheme of these acts is to enable districts to appoint local boards, with extensive powers of self-government, and to undertake and execute sanitary improvements, such as drainage and water supply on a large scale, paying for the expense thereof by a local rate or assessment.

As regards the power of removing nuisances, a statute was passed in 1855 for England, called the nuisances removal act, which has been amended by two subsequent acts. By these acts, some sanitary authority, called rural or urban, under 35 and 36 Vict. c. 79, is appointed the local authority for carrying out the provisions of the act, and these are of an extensive kind. The act defines a nuisance to include any premises in such a state as to be a nuisance or injurious to health; any pool, ditch, gutter, water-course, privy, urinal, cess-pool, drain, or ashpit, so foul as be a nuisance or injurious to health; any animal so kept as to be a nuisance, or injurious to health; and any accumulation or deposit, overcrowding, foul condition, or smoke. The local authority is to appoint a sanitary inspector at a proper salary. Any person aggrieved may give notice to the local board, or the sanitary inspector may do so. The local board has extensive powers; it can authorize its inspector, on reasonable complaint, to demand an entrance into any private premises so as to inspect their condition, and may order the removal of nuisances found to exist there. The local board, on finding a nuisance exists, direct their officer to go before a justice of the peace and procure an order directing the private party to abate the nuisance. If he refuse to do so, the local board may remove the nuisance at the expense of the party on whose premises it exists, and sue him for such expenses. If any candle-house, melting-house, soap-house, slaughter-house, or place for boiling offal, blood, bones, etc., be certified by the medical officer, or any two medical practitioners, to be a nuisance, or injurious to the health of the inhabitants of the neighborhood, the local board may cause the person carrying on such trade to appear before a justice of the peace, and if it is not satisfactorily proved that he does not use the best practicable means for preventing or counteracting the effluvia, he is fined. So if houses are overcrowded, this may be stopped. Provisions are also enacted with a view to prevent the spread of diseases in times of epidemics, and to prevent common lodging-houses being kept in a foul state. Another important provision relates to the seizure of diseased meat and provisions exposed to sale, and the medical officer of health, or inspector of nuisances, has at all times power to inspect any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, or flour; and if found unfit for food, or diseased, or unsound, they may be carried away then and there and destroyed, and the shopkeeper fined. The local authority may also order owners of houses to supply proper water-closets, and to cleanse gutters and cess-pools which are foul. Besides the above provisions as to nuisances generally, there are separate statutes for the English metropolis and the river Thames; thus furnaces in mills, factories, bake-houses, etc., in London, must consume their own smoke. These statutes are the 16 and 17 Vict. c. 128, and 19 and 20 Vict. c. 107. The public health act, 1875 (39 and 40 Vict. c. 55), practically codifies the law on all such matters. The rivers pollution act, 1876 (39 and 40 Vict. c. 75), deals with another important species of nuisance.

In Scotland, a nuisances removal statute was passed in 1856, and was re-enacted by the public health act, 1867, 30 and 31 Vict. c. 101. By that act the town council, or police commissioners of the place, are constituted the local authority for enforcing the act, and in other places the parochial board. Besides dealing with the same class of nuisances as the English act, the Scotch act provided for checking all trades and businesses offensive and injurious to the health of the neighborhood. Similar powers were given to the local board to enter private houses and explore the causes of nuisances. Diseased and unwholesome meat and provisions may also be seized. Common lodging-houses were to be registered, and to be subject to rules and regulations to be made by the local authority. With regard to towns in Scotland, an extensive code of police laws was enacted in the general police and improvement acts, 25 and 26 Vict. c. 101, 31 and 32 Vict. c. 102. The acts may be adopted by burghs; and villages above 700 of population may, by vote of house-holders, be converted into burghs for this purpose. A smoke nuisance act for Scotland was passed applicable to all burghs, 20 and 21 Vict. c. 73; 24 Vict. c. 17; 28 and 29 Vict. c. 102.

The above is the usual legal acceptation of the term nuisance, but the word is sometimes used popularly to denote that class of nuisances, caused by disorderly houses or brothels, which are familiarly described as common nuisances. In the law of England those who keep a brothel are liable to be indicted for a misdemeanor, but as there was often a difficulty in setting the law in motion in such cases, a statute of 25 Geo. II. c. 36, enacted that if any two inhabitants should give notice to a constable of such a house being kept, it should then be the duty of the constable under a penalty, to go with such inhabitants before a justice and engage to prosecute the keeper, and their expenses are paid by the parish out of the poor-rates. The same act provided that whoever in point of fact acted as the master or the mistress of the house, should be taken to be the keeper of the house. The punishment is fine and imprisonment. Of late an attempt has been made to convict a landlord under this statute when he knows of the character of his tenants, and refuses to give them notice to quit; but the courts have held that the mere fact of the landlord refusing to give notice to quit, and so to eject such tenants, was not enough to make him liable in any criminal punishment. In Scotland, the offense of keeping a brothel is punishable in a similar manner. But apart from the keeping of a brothel, there is no criminal offense committed in this country by those who frequent such houses for the purposes of prostitution unless where the circumstances amount to rape (q.v.), or abduction (q.v.), or an aggravated assault.

NULLA BONA, a legal phrase in England, descriptive of the return made to a sheriff, who in executing process against a debtor finds he has no goods.

NU'MA POMPIL'IUS, in the mythic history of Rome, was the successor of Romulus, the founder of the city. He was a native of Cures in the Sabine country, and was universally reverenced for his wisdom and piety. Unanimously elected king by the Roman people, he soon justified by his conduct the wisdom of their choice. After dividing the lands which Romulus had conquered, he proceeded, with the assistance of the sacred nymph Egeria, to draw up religious institutions for his subjects, and thus stands out in the primitive legend as the author of the Roman ceremonial law. His reign lasted for 39 years, and was a golden age of peace and happiness. The only feature in the myth of Numa Pompilius which we can regard as probably historical, is that which indicates the infusion of a Sabine religious element into Roman history at some remote period.

NUMANTIA, the chief t. of the Celtiberian people called Arevaci in ancient Spain, was situated on the Douro (Durius), in the neighborhood of the present Soria in old Castile. The site is probably marked by the present Puente de Guarray. Numantia is celebrated for the heroic resistance which it made to the Romans, from 153 B.C., when its citizens first met a Roman army in battle, to 134 B.C., when it was taken and destroyed by Scipio the younger, after a siege of 15 months, in the course of which famine and the sword had left alive very few of its 8000 brave defenders. The besieging force under Scipio amounted to 60,000 men.

NUMBERS, THEORY OF, the most subtle and intricate, and at the same time one of the most extensive, branches of mathematical analysis. It treats primarily of the forms of numbers, and of the properties at once deducible from these forms; but its principal field is the theory of equations, in as far as equations are soluble in whole numbers or rational fractions, and more particularly that branch known as indeterminate equations. Closely allied to this branch are those problems which are usually grouped under the diophantine analysis (q.v.), a class of problems alike interesting and difficult; and of which the following are examples: 1. *Find the numbers the sum of whose squares shall be a square number;* a condition satisfied by 5 and 12, 8 and 15, 9 and 40, etc. 2. *Find three square numbers in arithmetical progression;* Answer, 1, 25, and 49; 4, 100, 196, etc.

Forms of numbers are certain algebraic formulas, which, by assigning to the letters successive numerical values from 0 upwards, are capable of producing all numbers without exception, e.g., by giving to m the successive values 0, 1, 2, 3, etc., in any of the following groups of formulas: $2m$, $2m + 1$; $3m$, $3m + 1$, $3m + 2$; $4m$, $4m + 1$, $4m + 2$, $4m + 3$, we can produce the natural series of numbers. These formulas are based on the self-evident principle, that the remainder after division is less than the divisor, and that, consequently, every number can be represented in the form of the product of two factors + a number less than the smaller factor.

By means of these formulas, many properties of numbers can be demonstrated without difficulty. To give a few examples. (1.) *The product of two consecutive numbers is divisible by* 2: Let $2m$ be one number, then the other is either $2m + 1$ or $2m - 1$, and the product $2m\,(2m \pm 1)$ contains 2 as a factor, and is thus divisible by 2. (2.) *The product of three consecutive numbers is divisible by* 6: Let $3m$ be one of the numbers (as in every triad of consecutive numbers one must be a multiple of 3), then the others are either $3m - 2$, $3m - 1$; $3m - 1$, $3m + 1$; or $3m + 1$, $3m + 2$. In the first and third cases, the proposition is manifest, as $(3m - 2)\,(3m - 1)$, and $(3m + 1)\,(3m + 2)$, are each divisible by 2, and therefore their product into $3m$ is divisible by 6 (= 1.2.3). In the second case the product is $3m\,(3m - 1)\,(3m + 1)$, or $3m\,(9m^2 - 1)$, where 3 is a factor, and it is necessary to show that $m\,(9m^2 - 1)$ is divisible by 2: if m be even, the thing is proved; but if odd, then m^2 is odd, $9m^2$ is odd, and $9m^2 - 1$ is even; hence, in this case also the proposition is true. It can similarly be proved that the product of four consecutive numbers is divisible by 24 (= 1.2.3.4), of five consecutive numbers by 120 (= 1.2.3.4.5), and so on generally. These propositions form the basis for proof of many properties of numbers, such as that the difference of the squares of any two odd numbers is divisible by 8. The difference between a number and its cube is the product of three consecutive numbers, and is consequently (see above) always divisible by 6. Any prime number which, when divided by 4, leaves a remainder unity, is the sum of two square numbers: thus, $41 = 25 + 16 = 5^2 + 4^2$, $233 = 169 + 64 = 13^2 + 8^2$, etc.

Besides these, there are a great many interesting properties of numbers which defy classification; such as, that the sum of the odd numbers beginning with unity is a square number (the square of the number of terms added), i.e., $1 + 3 + 5 = 9 = 3^2$, $1 + 3 + 5 + 7 + 9 = 25 = 5^2$, etc.; and, the sum of the cubes of the natural numbers is the square of the sum of the numbers, i.e., $1^3 + 2^3 + 3^3 = 1 + 8 + 27 = 36 = (1 + 2 + 3)^2$, $1^3 + 2^3 + 3^3 \times 4^3 = 100 = (1 + 2 + 3 + 4)^2$, etc.

We shall close this article with a few general remarks on numbers themselves. Numbers are divided into *prime* and *composite*—prime numbers being those which contain no factor greater than unity; composite numbers those which are the product of two (not reckoning unity) or more factors. The number of primes is unlimited, and so consequently are the others. The product of any number of consecutive numbers is even, as also are the squares of all even numbers; while the product of two odd numbers, or the squares of odd numbers, are odd. Every composite number can be put under the form of a product of powers of numbers; thus, $144 = 2^4 \times 3^2$, or, generally, $n = a^p.b^q.c^r$, where a, b, and c are prime numbers, and the number of the divisors of such a composite number is equal to the product $(p + 1)(q + 1)(r + 1)$, unity and the number itself being included. In the case of 144, the number of divisors would be $(4 + 1)(2 + 1)$, or 5×3, or 15, which we find by trial to be the case. *Perfect numbers* are those which are equal to the sum of their divisors (the number itself being of course excepted); thus, $6 = 1 + 2 + 3$, $28 = 1 + 2 + 4 + 7 + 14$, and 496, are perfect numbers. *Amicable numbers* are pairs of numbers, either one of the pair being equal to the sum of the divisors of the other; thus, 220 ($= 1 + 2 + 4 + 5 + 10 + 11 + 20 + 22 + 44 + 55 + 110 = 284$), and 284 ($= 1 + 2 + 4 + 71 + 142 = 220$), are amicable numbers. For other series of numbers see FIGURATE NUMBERS.

The most ancient writer on the theory of numbers was Diophantus, who flourished in the 3d c., and the subject received no further development till the time of Vieta and Fermat (the latter being the author of several celebrated theorems, a discussion of which, however, is quite unsuited to this work), who greatly extended it. Euler next added his quota, and was followed by Lagrange, Legendre, and Gauss, who in turn successfully applied themselves to the study of numbers, and brought the theory to its present state. Cauchy, Libri, and Gill (in America) have also devoted themselves to it with success. The chief authorities down to the present century are Barlow's *Theory of Numbers* (1811); Legendre's *Essai sur la Théorie des Nombres* (3d ed., Paris, 1830); and Gauss's *Disquisitiones Arithmeticæ* (Brunswick, 1801; Fr. translation, 1807); and for the latest discoveries, the transactions of the various learned societies may be consulted.

NUMBERS, BOOK OF (LXX. *Arithmoi;* Heb. *Bamidbar*), the fourth book of the Pentateuch, consists of 36 chapters, embracing the history of the march of the Israelites through the desert, together with the special laws given during this period as complementary to the Sinaitic legislation. Beginning with the census of the people (whence the name of the book), and the assigning of the special places to each tribe with reference to the sanctuary, the whole people is classified, and the tribe of Levi specially singled out. Ordinances on the purity to be maintained in the camp, the functions of the priests, and a description of the passover, follow. The second portion of the book describes the journey from Sinai to the borders of Canaan, the miraculous sustenance of the people, their dissatisfaction and consequent rejection, together with various special laws respecting sacrifices, etc., and the episode of Korah. The third part embraces the first ten months of the fortieth year of the wandering—an epoch hurried over with remarkable swiftness by the historian. In quick succession, the renewed strife of the people with their leaders, the message to the king of Moab, the death of Aaron, the defeat of the king of Arad, the punishment of the people by serpents, the march from Hor to Pisga, and the victorious battle against the kings of Sihon and Og, are recounted, and the extraordinary episode of Balaam follows. The further wiles employed by the alarmed Moabites and Midianites to avert the threatening invasion, and their result, together with the second census, are narrated. Moses is warned of his death, and the vital question of his succession is settled. Further laws and ordinances respecting sacrifices and vows, the conquest of the Midianites, and the partition of the country east of the Jordan among certain tribes, a recapitulation of the encampments in the desert, a detailed specification of the manner in which the promised land should be divided after its conquest, and the final ordinance of the marriages of heiresses among their own tribe only, so as to preserve the integrity of landed property, make up the remainder of the book.

The book of Numbers is, like the rest of the Pentateuch, supposed by the greater part of modern critics to consist of several documents written by *Elohists* and *Jehovists* respectively. See GENESIS, PENTATEUCH.

NU'MERALS, the general name given to figures or symbols by means of which numbers are expressed (for Roman and Greek numerals, see NOTATION); the distinctive name of *Arabic numerals* being given to the nine figures or digits and the zero that are now in almost universal use among civilized nations for this purpose. Both the origin of these figures and the period at which they became known in Europe have been made subjects of laborious investigation; and it seems to be now proved beyond a doubt that they are of Indian, not Arabic, origin, and were invented by the Brahmans some time B.C. But the more important inquiry as to the time of their introduction into Europe has hitherto baffled all research. The simple and convenient theory that they were introduced into Spain by the conquering Arabs, and from that country, then a great seat of learning, a knowledge of them was disseminated throughout Europe, is contradicted by the fact that the eastern Arabs themselves had no knowledge of them previous to the time of the caliph Al-Mamun (818–33), while a knowledge of them existed in Europe from a considerably earlier date. The most probable theory is that they were brought from India, probably by the Neo-Pythagoreans, and introduced into Italy, whence they became known to a few of the learned men of eastern Europe. We have, however, every reason to suppose that the figures then known were totally different in form from those now used. These latter, called *gobar* by the Arabs, may have been brought to Bagdad during the reign of Al-Mansor (760), or his immediate successors, and certainly not later than the time of Al-Mamun. During the latter reign we know the present system of arithmetic was introduced into Persia from India, and most probably a knowledge of the gobar figures at the same time. Thence the system of arithmetic was brought to north-western Africa and Spain, and doubtless the figures along with it, about the end of the 10th or beginning of the 11th c., and from Spain a knowledge of both was speedily communicated to the rest of Europe, the gobar figures superseding those forms of eastern figures which had previously been employed. The knowledge of the figures, however, spread, as was natural, much more rapidly than the notation and arithmetic of which they were the foundation, and we consequently find in writings and inscriptions of the middle ages the gobar figures partly substituted for, and mixed up with, the Roman numerals; as, for instance, XXX2, for 32; X4, for 14, etc.; and occasionally such expressions as 302, 303, for 32 and 33. The earliest work on modern arithmetic was published in Germany in 1390; it explained the decimal notation and exemplified the elementary rules. The Arabic numerals were not generally introduced into England till the commencement of the 17th c., and it was long after that time before the decimal arithmetic became general. See a dissertation *Sur les Chiffres Indiens*, by M. Woepke, in the Asiatic journal.

NUMERALS (*ante*). The only valuable essays on the introduction of our present numerals are the works of Woepeke, in the *Encyclopædia Metropolitana*, London, 1845, vol. i., p. 412; in the *Journal Asiatique*, 6th series, vol. i., 1863, pp. 27, 234, 442; and his monograph, *Sur l'Introduction de l'Arithmetique Indien en Occident*, Rome, 1859. His knowledge of Sanskrit, Arabic, and the higher mathematics, may be seen in his reconstruction of that passage where the education of the infant Buddha is exemplified by a kind of competition-wallah, on the basis of the logical figure of the "heap." But we are only just beginning to get reliable dates in Indian archæology, and the edition of Prinsep by Thomas, 1863, the archæological part of the surveys of India, the labors of German scholars in the line of Shemitic influence on early Indian alphabets, all point to conclusions at variance with those of the scholars of the last generation. There are three sets of figures in use among what may be called the mathematical nations, the Sanskrit (this name is used because it does not identify them with any particular alphabet), the Neskhi (as used with the present Arabic alphabet), and the European. None are now as they were in the year 1000 A.D., and none is an immediate borrowing from another. All seem to have been once used without notational place, that is, without the zero, Arab-Greek τζιφρα, Sansk. suneja, both meaning *void*. The earliest Sanskrit figures appear to be of A.D. 674. Bactrian numerals are used till B.C. 116, they are Shemitic, and without notation. The Pali numerals which accompany the series of inscriptions from the 3d c. B.C. to the 5th c. A.D., are partly tallies, partly alphabetic, partly Shemitic, and are also without notation. The Sanskrit figures must be traced back through a Devanagari 10th c. type, through a still older Kashmir shape, to identifiable initials of their Pali (?) names in characters which are not quite identical with either Pali, Allahabad, or Sindhmultani. The resemblance of 1, 2, 3 to our own figures vanishes as we go back, and the only shadow of likeness is an accidental form of the old 7. Evidently, there remains at that point not the slightest resemblance to any modern Devanagari letters, nor are the letters those usually proposed, as the six is spelled with chh, and seven with t. The other two types are, as to a few of their figures, bound together by a common origin, though dissimilar in shape and derivation. It may be well to remind the reader that Alexandria, with the party-colored nationalities who traded there, serves as a great receptacle, not only of all the mysticism but of all the knowledge of the antique east. What a jumble of perverted intelligence remained long after any practical instruction had vanished may be easily seen by studying any of the patristic compilations, or any of the early Arabic encyclopædists. The Arabs of n. Egypt and Barbary, Mughrabin, had always certain heretical traditions, a different arrangement of the supplementary letters of the alphabet, and certain differences in the figures, which distinguished them from their fellows of the east. Their civilization seems earlier and more practical. The oldest figures known (except Chinese current marks) are the Egyptian, and they go

I· II· III· IIII·, which in Demotic are changed to one long stroke, with the others reduced each to a short scrabble on its upper left side. The Hieratic changes the tallies to a series of vertical scrabbles, and from these come the Demotic signs for months, 1, 2, 3, almost identical with our figures. These furnish the radical distinction between Arabic and Gobar figures. The Arabic, at least the Neskhi, takes the first four Demotic figures, and, necessarily reversing them in its writing from right to left, adds to them others, of which only 9 bears a chance resemblance to an European figure. The Gobar takes the three Demotic month figures, adds the Demotic common 4, and the rest are identical with the old Mughrab, with the apices of Boethius, and with our modern figures. Variant types are old Arabic 4 like a Greek sigma, Σ, and 5 like our 8 with a tail; the Gobar and the Boethian signs have another 2, like a Saxon t; the 14th c. European 4 is like a Greek lambda, Λ. The apices, occurring in an old manuscript of Boethius, but unfortunately not to be fixed in date, have every appearance of being Gnostic. The signs are strangely deformed, and their names, affixed, are from 4 to 9, Syrian, but 1 and 2 are Indo-German, and 3 unreadable. As the Gobar seem older than the Neskhi, and as their first four figures are undoubtedly Egyptian, it may be that the rest, our figures of to-day, are also debased Demotic. They would be either alphabetical—but of the sequence of the Demotic alphabet we are not entirely certain—or initial—but, if so, of Coptic numbers, or of Arabic numbers spelled in Coptic? It seems impossible to tell, and no guessing, or discovery of chance relation in appearance, is of the slightest value. A series of deductions would attribute the other Neskhi figures to either a Syriac alphabet becoming Kufic, or perhaps to some arrangement of Perso-Bactrian signs with which we are not yet acquainted. The manuscript of Washiyi will show with how many signs an inquisitive Arab of his time might be familiar, while without real knowledge of a single alphabet, even, beside his own.

NUMERATION, the reading off of numbers that are expressed by figures. As shown in notation (q v.), the first figure on the right hand expresses units; the next, tens; the third, hundreds; and following the same nomenclature with the next three figures, we have the fourth expressing units of thousands; the fifth, tens of thousands; the sixth, hundreds of thousands. The seventh figure, in like manner, expresses units of millions; the eighth, tens of millions; and the ninth, hundreds of millions. When this method is consistently followed out, as is the case with French and other continental arithmeticians, the fourth period, or group of three figures, is denominated billions, the first figure of it (the tenth from the extreme right) being units of billions; the next, tens of billions; etc. Read in this way, the figures 56,084,763,204,504 express fifty-six trillions, eighty-four billions, seven-hundred-and-sixty-three millions, two-hundred-and-four thousands, five-hundred-and-four units. In Britain there is a slight variation in the mode, the only effect of which is to render it a little more complicated; thus, after units of millions, come tens and hundreds of millions, but then instead of billions we have, according to the current usage, thousands of millions; after this, tens of thousands of millions and hundreds of thousands of millions, and then billions, which occupy the 13th figure from the right, and are reckoned in the same way as millions, so that the next unit or *trillions* does not come in till the 19th figure. The above number, according to the British mode, would be read fifty-six billions, eighty-four-thousand-seven-hundred-and-sixty-three millions, two-hundred-and-four thousands, five-hundred-and four units. The first method is perfectly symmetrical, keeping throughout to divisions of three figures; the second only keeps to this division up to hundreds of millions, when it changes it for a division into parcels of six figures, which are named from units up to hundreds of thousands of units. The latter mode is, however, gradually falling into disuse.

NUMIDA. See GUINEA FOWL, *ante.*

NUMID'IA (Gr. *Nomadia*, the land of Nomads), the name given by the Romans to a part of the n. coast of Africa, corresponding to some extent with the modern Algiers. It was bounded on the w. by the river Mulucha (now *Moluya*), which separated it from Mauritania; on the e. by the river Tusca (now *Wadi-el-Berber*), which separated it from the territory of Carthage, the *Africa Propria* of the Romans; on the s. it reached to the chains of mt. Atlas and the Lacus Tritonis, which separated it from the land of the Gaetulians and interior Libya. The chief rivers were the Rubricatus and the Ampsaga. The inhabitants of Numidia, as of Mauritania, belonged to the race from which the modern Berber are descended. They were a warlike race, and excelled as horsemen; but, like most barbarians, were faithless and unscrupulous. Of their tribes, the *Massyli* in the e., and the *Massæsyli* in the w., were the most powerful. In the grand struggle between the Carthaginians and the Romans, they at first fought on the side of the former, but subsequently the king of the eastern Numidians, Massinissa, joined the Romans, and rendered them effectual service in the war with Hannibal. Favored by the conquerors he united all Numidia under his sway. Of his successors in this kingdom Jugurtha and Juba are the most famous. After the victory of Cæsar over Juba I., in the African war, Numidia became a Roman province (46 B.C.); but Augustus afterwards gave the western part—from the river Ampsaga, now Wadi-el-Kibbir—with Mauritania, to Juba II., and the name Numidia became limited to the eastern part; and when Mauritania became a Roman province, the western part was called Mauritania Cæsariensis.

Among the Roman *coloniæ* were Hippo Regius, near the mouth of the river Rubricatus; Cirta (the residence of the Numidian kings), afterwards called Constantina, a name still preserved in Constantine; Sicca, and Rusicada. For the modern history of Numidia see ALGIERS.

NUMISMATICS (Lat. *nummus* and *numisma*, money; Gr. *nomisma*, from *nomos*, law, a medium of exchange established by law), the science which treats of coins and medals. A coin is a piece of metal of a fixed weight stamped by authority of government, and employed as a circulating medium. A medal is a piece struck to commemorate an event. The study of numismatics has an important bearing on history. Coins have been the means of ascertaining the names of forgotten countries and cities, their position, their chronology, the succession of their kings, their usages—civil, military, and religious—and the style of their art. On their respective coins we can look on undoubtedly accurate representations of Mithridates, Julius Cæsar, Augustus, Nero, Caracalla, and read their character and features.

The metals which have generally been used for coinage are gold, silver, and copper. In each class is comprised the alloy occasionally substituted for it, as electrum (an alloy of gold and silver) for gold, billon for silver, bronze for copper, and potin (an alloy softer than billon) for silver and copper. The side of a coin which bears the most important device or inscription is called the *obverse*, the other side the *reverse*. The words or letters on a coin are called its inscription; an inscription surrounding the border is called the *legend*. When the lower part of the reverse is distinctly separated from the main device, it is called the *exergue* (Gr. *ex ergou*, without the work), and often bears a secondary inscription, with the date or place of mintage. The field is the space on the surface of the coin unoccupied by the principal device or inscription.

The use of coined money cannot be traced further back than the 9th c. B C. Money, however, as a medium of exchange, existed much earlier, and when of metal it passed by weight, no piece being adjusted to any precise weight, and all money being weighed when exchanged. Early metallic money was in the form of bars, spikes, and rings; the ring money could be opened, closed, and linked in a chain for convenience of carriage.

The Lydians are supposed to have been the first people who used coined money, about 700 or 800 years before the Christian era; and their example was soon after followed by the different states of Greece, the earliest Greek coins being those of Ægina. In its early stages the process of coining consisted in placing a lump of metal of a fixed weight, and approaching to a globular form, over a die, on which was engraved the religious or national symbol to be impressed. A wedge or punch placed at the back of the metal was held steadily with one hand, and struck by a hammer with the other, till the metal was sufficiently fixed in the die to receive a good impression. The impression was a guarantee of the weight of the piece. From the nature of the process, the earliest coins had a lumpish appearance, and on their reverse was a rough, irregular, hollow square, corresponding to a similar square on the punch, devised for the purpose of keeping the coin steady when struck by the coining hammer. The original coins of Asia Minor were of gold, those of Greece of silver. The earliest coins bear emblems of a sacred character, often embodying some legend regarding the foundation of the state, as the *phoca* or seal on the coins of the Phocians, which alludes to the shoal of seals said to have followed the fleet during the emigration of the people. A very early double stater of Miletus, in Ionia, of which the type is the lion's head, was derived from Persia and Assyria, and associated with the worship of Cybele, a symbol which is continued in the later coinage of Miletus. Types of this kind were succeeded by portraits of protecting deities. The earliest coins of Athens have the owl, as type of the goddess Athene; at a later period, the head of the goddess herself takes its place, the owl afterwards re-appearing on the reverse. The punch-mark, at first a rudely-roughed square, soon assumed the more sightly form of deep, wedge-like indents, which in later specimens become more regular, till they form themselves into tolerably symmetrical square. In the next stage, the indents become shallower, and consist of four squares forming one large one. The surrounding of the punch-mark with a band bearing a name, and the introduction of a head in the center, gradually led to the perfect reverse. There is a remarkable series of so-called "encased" coins struck in Magna Græcia, of which the reverse is an exact repetition in concave of the relief of the obverse. These coins are thin, flat, sharp in relief, and beautifully executed.

The leading coin of Greece and the Greek colonies was the stater, so called because founded on a standard of weight generally received before the introduction of coined money. There were double staters, and half, third, and quarter staters, and the stater was equivalent in value to six of the silver pieces called drachmæ. The obolus was one sixth of the drachma, at first struck in silver, in later times in copper.

The inscriptions on the earliest Greek coins consist of a single letter, the initial of the city where they were struck. The remaining letters, or a portion of them, were afterwards added, the name, when in full, being in the genitive case. Monograms sometimes occur in addition to the name, or part name, of the place. The first coin bearing the name of a king is the tetradrachm (or piece of four drachmæ) of Alexander I., of Macedon.

Among the early coins of Asia, one of the most celebrated is the stater Daricus or Daric, named from Darius Hystaspes. It had for symbol an archer kneeling on one knee, and seems to have been coined for the Greek colonies of Asia by their Persian conquerors. In the reign of Philip of Macedon the coinage of Greece had attained its full development, having a perfect reverse. One of the earliest specimens of the complete coin is a beautiful medal struck at Syracuse, with the head of Proserpine accompanied by dolphins, and for reverse a victor in the Olympic games in a chariot receiving a wreath from victory—a type which is also found on the reverse of the staters of Philip of Macedon, known as Philips, and largely imitated by other states. Coins of Alexander the great are abundant, many having been struck after his conquests in the Greek towns of Asia. A rose distinguishes those struck at Rhodes, a bee those struck at Ephesus, etc.; these are all types generally accompanying the figure of Zeus on the reverse; on the obverse is the head of Hercules, which has sometimes been supposed to be that of Alexander himself. It would rather seem, however, that the conqueror's immediate successors were the first who placed their portrait on the coins, and that under a shallow pretence of deification, Lysimachus as a descendant of Bacchus, and Seleucus of Apollo, clothed in the attributes of these deities Two most beautiful and important series of Greek coins are those of the Seleucidæ, in Asia, of silver, and of the Lagidæ or Ptolemies, in Egypt, of gold.

In Palestine there is an interesting series of coins founded on the religious history of the Jewish nation, and assigned to Simon Maccabæus. They are shekels and half-shekels, equivalent to two attic drachmæ and one drachma respectively. The shekels bear on the obverse the pot of manna, with the inscription "Schekel Israel" (the Shekel of Israel); on the reverse is Aaron's rod with three flowers, and the legend "Ierouschalim kedoschah" (Jerusalem the holy). The inscriptions are in the Samaritan character. The successors of Simon assumed the title of king, and placed their portraits on the coins, with inscriptions in Greek as well as in Hebrew.

Roman coins belong to three different series, known as the republican, the family, and the imperial.

The so-called republican, the earliest coinage, began at an early period of Roman history, and subsisted till about 80 B.C. Its standard metal was copper, or rather *æs* or bronze, an alloy of copper. The standard unit was the pound weight divided into twelve ounces. The *æs*, *as*, or pound of bronze, is said to have received a state impress as early as the reign of Servius Tullius, 578 B.C. This gigantic piece was oblong like a brick, and stamped with the representation of an ox or sheep, whence the word *pecunia*, from *pecus*, cattle The full pound of the as was gradually reduced, always retaining the twelve (nominally) uncial subdivisions, till its actual weight came to be no more than a quarter of an ounce. About the time when the as had diminished to nine ounces, the square form was exchanged for the circular. This large copper coin, called the "as grave," was not struck with the punch, but cast, and exhibited on the obverse the Janus bifrons; and on the reverse, the prow of a ship, with the numeral I. Of the fractions of the as, the sextans, or the sixth part, generally bears the head of Mercury, and the uncia, or ounce piece, that of Minerva; these pieces being further distinguished by dots or knobs, one for each ounce. There were circular pieces as high as the decussis, or piece of twelve asses, presenting a head of Roma (or Minerva), but none are known to have been coined till the weight of the as had diminished to four ounces. The Roman uncial coinage extended to the other states of Italy, where a variety of types were introduced, including mythological heads and animals. In the reign of Augustus, the as was virtually superseded by the sestertius, called by numismatists the first bronze, about the size of our penny, which was at first of the value of two and a half, afterwards four asses. The sestertius derived its value from the silver denarius, of which it was the fourth. The half of the sestertius was the dupondius (known as the second bronze), and the half of the dupondius was called the assarium, an old name of the as. The assarium is known to numismatists as the third bronze.

Silver was first coined at Rome about 281 B.C., the standard being founded on the Greek drachma, then equivalent in value to ten asses; the new coin was therefore called a denarius, or piece of ten asses. The earliest silver coined at Rome has on the obverse the head of Roma (differing from Minerva by having wings attached to the helmet): on the reverse is a quadriga or biga, or the Dioscuri. Among various other types which occur in the silver of the Italian towns subject to Rome are the horse's head, and galloping horse, both very beautiful. During the social war, the revolted states coined money independently of Rome, and used various devices to distinguish it as Italian and not Roman money.

The earliest gold coins seem to have been issued about 90 B.C., and consisted of the scrupulum, equivalent to 20 sestertii, and the double and treble scrupulum. These pieces bear the head of mars on the obverse, and on the reverse an eagle standing on a thunderbolt, with the inscription "Roma" on the exergue. The large early republican coins were cast, not struck.

The family coins begin about 170 B.C., and about 80 B.C. they entirely supercede the coins first described. Those families who successively held offices connected with the public mint acquired the right first to inscribe their names on the money, afterwards to introduce symbols of events in their own family history. These types gradually superseded the natural ones; the portrait of an ancestor followed; and then the portrait of a living citizen, Julius Cæsar.

Under the empire, the copper sestertius, which had displaced the as, continued the monetary standard. A magnificent series exists of the first bronzes of the emperors from Augustus to Gallienus. While it was the privilege of the emperors to coin gold and silver, copper could only be coined *ex senatus consulto*, which from the time of Augustus was expressed on the coins by the letters S.C., or EX S.C. The obverse of the imperial coins bears the portraits of the successive emperors, sometimes of the empress or other members of the imperial family; and the reverse represents some event, military or social, of the emperor's reign, sometimes allegorized. The emperor's name and title are inscribed on the obverse, and sometimes partly continued on the reverse; the inscription on the reverse generally relates to the subject delineated; and towards the close of the 3d. c., the exergue of the reverse is occupied by the name of the town where the coin is struck. The coins of Augustus and those of Livia, Antonia, and Agrippina the Elder have much artistic merit. The workmanship of Nero's sestertii is very beautiful. The coins of Vespasian and Titus commemorate the conquest of Judea. The colosseum appears on a sestertius of Vespasian. The coins of Trajan are noted for their architectural types. Hadrian's coins commemorate his journeys. The coins and medals of Antonine, Marcus Aurelius, and the two Faustinæ are well executed; as are also those of Commodus, of whom a remarkable medallion relates to the conquest of Britain. There is a rapid falling off in design after the time of Commodus, and base silver comes extensively into use in the reign of Caracalla. Gallienus introduced the practice of coining money of copper washed with silver.

The colonial and provincial money of this period was very inferior to that coined in Rome In the coins of the provinces which had been formed out of the Greek empire, the obverse bears the emperor's head and the reverse generally the chief temple of the gods in the city of coinage; the inscriptions are in Greek. In the imperial coins of Alexandria appear such characteristic devices as the heads of Jupiter Ammon, Isis, and Canopus, the sphinx, the serpent, the lotus, and the wheat-ear. Colonial coins were at first distinguished by a team of oxen, afterwards by banners, the number of which indicated the number of legions from which the colony had been drawn.

After the time of Gallienus, the colonial money and the Greek imperial money, except that of Alexandria, ceased, and much of the Roman coinage was executed in the provinces, the name of the town of issue appearing on the exergue. Diocletian introduced a new piece of money, called the follis, which became the chief coin of the lower empire. The first bronze has disappeared after Gallienus, and the second disappears after Diocletian, the third bronze diminishing to $\frac{1}{16}$ of an ounce. With the establishment of Christianity under Constantine, a few Christian types are introduced. The third bronze of that emperor has the Labarum (q.v.), with the monogram IHS. Large medallions, called *contorniati*, encircled with a deep groove, belong to this period, and seem to have been prizes for distribution at the public games. Pagan types recur on the coins of Julian; and after his time the third bronze disappears.

The money of the Byzantine empire forms a link between the subject of ancient and that of modern coins. The portrait of the emperor on the obverse is, after the 10th c., supported by some protecting saint. The reverse has at first such types as Victory with a cross, afterwards a representation of the Saviour or the Virgin; in some instances, the Virgin supporting the walls of Constantinople. Latin is gradually superseded by Greek in the inscriptions, and wholly disappears by the time of Alexius I. The chief gold piece was the solidus or nomisma, which was long famed in commerce for its purity, and circulated largely in the west as well as the east of Europe.

Of the coins of the middle ages, the most important is the silver denier or penny, derived from the Latin denarius. Its half was the obole, first of silver, afterwards of billon. Coins of this description were issued in the German empire, France, England, and the Scandinavian states, and in many cases by ecclesiastical princes and feudal lords as well as sovereigns. The obverse of the regal coin of the early middle ages is generally the bust of the sovereign, and the reverse a Greek cross, accompanied by the royal name or title, and the place of mintage or the moneyer (see MINT). The arms of the country were introduced in the 12th c., in conjunction with the cross, and afterwards superseded it. In the 13th and 14th centuries, coins began to be issued by free imperial cities or corporations of towns; and there prevailed extensively throughout Germany and other parts of Europe a thin piece called a bracteate, in relief on one side, and hollow on the other, often not bearing a single letter, and rarely a full inscription. Down to the 14th c., the relief of the mediæval coins is very inconsiderable, the pieces thin, and the art poor.

Britain received the Roman money on its subjugation. Constantine seems to have had a mint in London, and the Roman currency continued to circulate for a time after the departure of the conquerors. The first independent coinage, however, shows hardly a trace of the influence of Rome; it consists of two small coins, called the skeattæ and styca, the former of silver, the latter of copper. Both seem to belong solely to the Saxon kingdom of Northumbria; they are without inscriptions; a bird, a rude profile, and several unintelligible symbols appear on them, and their art is of the most debased kind. In the other kingdoms of the heptarchy silver pennies were coined, first intended to be $\frac{1}{240}$ of a pound weight; on the disappearance of skeattæ and stycæ, they form, with the occasional addition of half-pennies, the sole currency of England down to the reign of Edward III. The pennies of the heptarchy bear the name of the king or of the moneyer; a cross sometimes appears after the introduction of Christianity, and in later times a rude head of the king or queen. The pennies of the Saxon and Danish sole monarchs of England have a somewhat similar character. Alfred's earlier coins have a grotesque-looking portrait, and on the reverse a monogram of London; in his later coins the head disappears, and a cross and circle take its place. A cross variously ornamented with three pellets in each angle continues to be the usual reverse of the Saxon, Norman, and Plantagenet coins. The coins of Edward III. are a great artistic advance on those that preceded them. The silver coinage of that king consisted not only of pennies, half-pennies, and farthings, but also of groats and half-groats. The obverse of the groat bears a conventional crowned head within a flowered circle of nine arches, the words "Dei Gratia" and the title "Rex Franciæ" appearing for the first time in the legend. The reverse has the motto "Posui Deum adjutorem meum," which continued on the coinage till the time of Edward V. But the great numismatic feature of Edward III.'s reign is the issue of gold nobles, worth six shillings and eightpence. The obverse of those beautiful coins represent the king in a ship, a sword in his right hand, in his left a shield with the quartered arms of France and England. The reverse is a rich cross flory within a circle of eight arches, and a lion under a crown in each angle of the cross, the legend being "Ihesus autem transiens per medium illorum ibat." Half and quarter nobles were also coined. The noble having increased in value, a coin called an angel, of the former value of a noble, was issued by Henry VI. and Edward IV. The obverse represented St. Michael transfixing a dragon, the reverse a ship, with a cross for the mast.

As we approach the period of the reformation, the coinage gradually becomes more ornate. The nobles coined by Edward IV., after the value of that coin had been fixed at 10 shillings, were called rials (a name derived from a French coin), and the double rial or sovereign was first coined by Henry VII. The obverse has the king on his throne with scepter and orb, and on the reverse, in the center of a heraldic full-blown rose, is a shield with the arms of France and England. The testoon, or shilling, valued at twelve pence, also first appeared in this reign, with the royal profile crowned on the obverse, and the royal arms quartered by the cross on the reverse. A great debasement of the coinage took place in the reign of Henry VIII. The reverse of the farthings of that monarch bears a portcullis, that of the shillings a rose surmounted by a crown, and of the sovereigns, the royal arms supported by a lion and dragon. A noble was coined with St. George and the dragon on the obverse, and on the reverse a ship with three crosses for masts, and a rose on the center mast. On the coins of Henry VIII. the title "Hiberniæ Rex" first appeared, former kings having only styled themselves "Dominus Hiberniæ," Ireland not being accounted a kingdom. Under Edward VI. the silver coins called crowns and half-crowns appear, having for device the king crowned on horseback in the armor of the period. They derived their name from coins circulating on the continent, which had for device a crown. The royal arms in an oval shield without the cross are introduced as the reverse of the shilling. From this period there is a very obvious decline in the artistic feeling of the English coins. On some of the shillings of Mary, her bust and that of Philip face each other, the insignia of Spain and England impaled occupying the reverse; afterwards the king's head occupies one side of the coin, and the queen's the other. Half sovereigns, or rials, and angels were coined of the old type of Edward IV. The great event in the coinage of Elizabeth's reign was the temporary introduction of the mill and screw, instead of the hammer and punch, producing coins of a more regular and workmanlike appearance. The profile bust of James I., crowned and in armor, appears on his shillings and smaller pieces; on his crowns and half-crowns he is represented on horseback; on the reverse are the quartered arms of the three kingdoms (the harp of Ireland appearing for the first time on the coinage), with the motto "Que Deus conjunxit nemo separet." Copper farthings, with crown, scepter, and sword on the obverse, and a harp on the reverse, were coined for England as well as Ireland, the first copper money issued in England since the styca. Private tokens of copper, issued by tradesmen and others, had, however, been in circulation before, and came again into use to a large extent at a later period. Charles I. coined ten and twenty shilling pieces of silver, the former a very noble coin, with a representation of the king on horseback. A crown, struck at Oxford, bears on the obverse the king on horseback, with a representation of the town, and on the reverse the heads of the Oxford declaration. The guinea, first coined in this reign, was so called from the metal being procured from the coast of Guinea; its original value was but twenty shillings.

The coins of the commonwealth exhibit a shield with the cross of St. George surrounded by a palm and olive branch, and have for legend "the commonwealth of England." On the reverse are two shields accollée, with the cross of St. George and the harp of Ireland, and the motto "God with us." Coins far superior in character were executed by Cromwell, with his laureated bust and title as protector, and on the reverse a crowned shield quartering the cross of St. George, of St. Andrew and the harp, with the protector's paternal arms in surtout; but few of these were issued. In the early coins of Charles II., that monarch is crowned, and in the dress of the time; in his later money he is in conventionalized Roman drapery, with the head turned to the left, and from that time it has been the practice to turn every king's head the reverse way from that of his predecessor. The four shields on the reverse are disposed in the form of a cross (an arrangement which continued till the reign of George II.), and on the edge of the crowns and half-crowns is the legend "Decus et tutamen." Charles II. issued a copper coinage of half-pennies and farthings; on the former appears the device of Britannia, taken from the Roman coins relating to Britain. Pennies were not coined till George III.'s reign. The coins of William and Mary have the profiles of the king and queen one over the other, and the shields of the three kingdoms in the form of a cross on the reverse, with Nassau in the center. The coinage of William alone, after the death of Mary, is of somewhat improved design, sir Isaac Newton being then master of the mint. Little change in the general design of the coin occurs in the reigns of Anne and George I. On the accession of the house of Hanover, the Hanoverian arms are placed in the fourth shield, and George IV. substituted a quartered shield with Nassau en surtout for the four shields on the reverse of his gold coins. During the greater part of George III.'s reign the coinage was utterly neglected, and the silver pieces in circulation were worn perfectly smooth. When coins were at last issued, the Roman conventionalism of the previous reigns gave way to a now fashionable Greek conventionalism. The quartered shield supplanted the four shields, and on the reverse of the crown appeared a Grecianized St. George and the dragon. George IV.'s bust is taken from Chantrey's statue; the rose, thistle, and shamrock, united under a crown, appear on the reverse of his shilling. Silver groats were issued in the reign of William IV. The ensigns of Hanover disappeared at the beginning of the present reign; the reverse of the shilling is even poorer than that of George IV., the words "One shilling" occupy the field, surrounded by an oak branch and a laurel branch; silver pieces of three pence have been introduced. But the principal monetary event is the issue of the silver florin, in value equivalent to two shillings, looked on as a step towards the institution of a decimal coinage. It represents the head of the queen crowned, with the legend in old English character, and for reverse the four shields are once more placed in the form of a cross.

No native Scottish coinage existed earlier than the 11th century. Coins are extant of Somerled, prince of the Isles of that century, and of Alexander I. of the century following. The silver pennies of William the lion, and Alexander II. and III., are like contemporary English money, but ruder, and bear the names of the moneyers and place of mintage, generally Edinburgh, Perth, or Berwick. The profiles on the coins of John Baliol, Robert Bruce, and David II. are attempts at portraiture. A remarkable gold piece, first coined by Robert II., is the St. Andrew, with the arms of Scotland on the obverse, and St. Andrew on his cross on the reverse. In the four succeeding reigns the weight of the silver coins rapidly decreased, and coins of billon, or base metal, were issued, nominally pennies, but three and a half of which eventually passed for a silver penny. The evil increased, and baser and baser alloy was used. Groats of billon, known as placks and half-placks, were coined by James III. James IV.'s coins have a characteristic portrait, and a good deal of artistic feeling. James III. and IV. issued well executed gold pieces, called unicorns and riders, the type of the one being the unicorn, of the other the king on horseback. A still more beautiful coin was the gold bonnet piece of James V., so called from the cap in the king's portrait. Of Mary there are a great variety of interesting pieces. The portrait is sometimes crowned, sometimes uncrowned; and on the coin issued soon after Francis's death, has a widow's cap and high-frilled dress. The types in James VI.'s reign are also very various. On his accession to the English throne, the relative value of English and Scottish coins was declared to be as 12 to 1. The coins afterwards issued from the Scottish mint differed from the English, chiefly in having Scotland in the first quarter in the royal shield. The last Scottish gold coinage consisted of pistoles and half-pistoles of Darien gold, about the size of a guinea and half-guinea, struck by William III.; the pistole distinguished by a rising sun under the bust of the king.

The coinage of Ireland is scanty and uninteresting compared with that of Scotland. The coins of English monarchs struck in Dublin resemble much those current in England. Henry VIII. first placed a harp on the Irish coins.

In France, the earliest coins are those of the Merovingian kings, rude imitations of the late Roman and early Byzantine money, and mostly of gold. Under the Carlovingian dynasty, deniers and oboles are the prevailing coinage, remarkably rude in fabric without portrait, and bearing the name of the king and place of mintage. Some coins of Charlemagne, struck at Rome, are of better workmanship. They contain one letter of "Roma" at each extremity of the cross, with the legend "Carolus IP." The coinage improved under the Capetian kings; the fleur-de-lis appears in addition to the cross. In the 13th c. gold pieces were issued, and in the time of Philip VI. both the design and the execution of the coins are beautiful. The coins of Louis XII. are the first that bear the royal portrait. The modern coinage may be said to begin under Henry II., whose portrait is good. The seignorial coins of France in the middle ages are of considerable importance, and the medals of Louis XIV. and Napoleon I. are much more interesting than the modern coins.

The mediæval coinage of Italy is of great interest. The money of the Lombard kings of Italy and dukes of Benevento, is little inferior to that of the Greek emperors. There is a beautiful series of gold and silver pieces belonging to Venice, bearing the names of the doges, and having generally for type the doge receiving the gonfalon, or standard of St. Mark. The gold florins of Florence, with the lily for device, are no less celebrated, and were imitated by other states. Florence had also a remarkable series of medals, with admirable portraits of persons of note. The coins of the popes, from Hadrian I. down to the 14th c., bear the name of the pope and emperor of the west; those of later date are beautiful in execution, and have seated portraits of the pontiffs, with the cross-keys and miter for reverse. A remarkable series of medals commemorates the chief events of each reign, one of which, struck after the massacre of St. Bartholomew, has for type an angel slaying the Huguenots, and the inscription "Ugonottorum strages." The coins of the Norman princes of Naples struck in Sicily, have the legends partly or wholly in Arabic. Malta has a series, with the arms and effigies of the grand-masters.

The mediæval money of Germany comprises coins of the emperors, the electors, the smaller princes, the religious houses, and the towns. The imperial series is extensive and very interesting, though, till near the close of the middle ages, it is rather backward in its art. About the reformation period, however, there are vigorous portraits both on its current coins and on the medals, and those double-dollars which are virtually medals. The coins of the dukes of Saxony, with their portraits are equally remarkable. The coins of the archbishops of Cologne, Mainz, and Treves form a very interesting series, the first more especially, with a representation of the cathedral.

The coins of the Low Countries resemble those of France and Germany. The Dutch medals are of interest, more especially those struck in commemoration of events in the war with Spain.

The coins of the Swiss cantons and towns during the early period of Swiss independence bore the heraldic shield of each, drawn with vigorous grotesqueness. There are also pieces struck by ecclesiastical lords, and by different families who had a right of coinage.

The coins of Spain begin with those of the Gothic princes, which are chiefly of gold, and on the model of the trientes and semisses of the lower empire. Some of the early pieces have a rude head of the monarch on one side, and of the emperor on the other. Afterwards, the obverse bears the profile of the monarch, and the reverse a cross of some description, with the name of the place of mintage, and the word "Pius" for legend. In later times, there are two interesting series of coins belonging to the kingdom of Aragon and to the kingdom of Castile and Leon.

The coinages of Norway and Sweden at first resembled the British, and afterwards the German type. From the 10th to the 14th c., bracteates were issued by the ecclesiastics. The coinage of Hungary begins in the 11th c., and has the portraits of the monarchs. The Russian coinage is Byzantine in character, and rude in its art. The earliest pieces are the silver darga of the 14th c., of an oblong shape, with representations of the prince on horseback, and various legendary subjects. Peter the great introduced the usual European type. There is an important series of bronze coins of the crusaders, beginning with Tancred, and coming down to the end of the 15th c., including money of the kings of Cyprus and Jerusalem, and other princes established in the east.

In India, the succession of the kings of Bactria, the remotest of the dynasties founded on the ruins of Alexander's empire, has only become known through their recently discovered coins. There are early rude Hindu coins of the Gupta line, with figures of the Brahmanic divinities of a type still in use.

Of the coins of the Mohammedan princes, the oldest gold pieces are the bilingual coins of cities of Syria and Palestine, of the middle of the 7th c. (A.H. 78, barbarous imitations of the latest Byzantine money of Alexandria. Most of the Mohammedan coins are covered exclusively by inscriptions expressive of the elementary principles of the Mohammedan faith. For some centuries, no sovereign except the caliph was allowed to inscribe his name on the coin. Large gold coins of great purity were issued by the Moslem kings of Granada in Spain.

The high prices given for ancient coins have led to numerous forgeries from the 15th c. downwards. Against such imitations, collectors require to be on their guard.

Among the best works on numismatics are Eckhel, *Doctrina Numorum Veterum* (Vienna, 1792-98); Hennin, *Manuel de Numismatique Ancienne* (Paris, 1830); Grasset, *Handbuch der alten Numismatik* (Leipsic, 1852-53); Leake, *Numismata Hellenica* (London, 1854); Ruding's *Annals of the Coinage of Great Britain* (London, 1840); Patrick's *Records of the Coinage of Scotland* (1877); Leblanc, *Traité Historique des Monnoies de France* (Paris, 1690); Cappe, *Die Münzen der Deutschen Kaiser* (1850); Marsden, *Numismata Orientalia Illustrata* (London, 1823-25); Boutkovski, *Dictionnaire Numismatique* (Leip. 1877).

NUMITOR. See ROMULUS, *ante*

NUM'MULITE LIMESTONE, an important member of the Middle Eocene period, consisting of a limestone composed of nummulites held together by a matrix formed of the comminuted particles of their shells, and of smaller foraminifera. It forms immense masses of the strata which are raised up on the sides of the Alps and Himalayas, and may be traced as a broad band often 1800 m. in breadth, and frequently of enormous thickness, from the Atlantic shores of Europe and Africa, through western Asia, to northern India and China. It is known also to cover vast areas in North America.

NUMMULITES, or NUMMULINA (Gr. money-fossil), a genus of fossil foraminefera, the shells of which form immense masses of rock of Eocene age. See NUMMULITE LIMESTONE. Upwards of 50 species have been described. They are circular bodies of a lenticular shape, varying in magnitude from the merest point to the size of a crown-piece. The shell is composed of a series of small chambers arranged in a concentric manner. The growth of the shell does not take place only around the circumference, but each whorl invests all the preceding whorls, so as to form a new layer over the entire surface of the disk, thus adding to the thickness as well as the breadth, and giving the fossil its lenticular form. A thin intervening space separates each layer from the one which it covers, and this space at the margin swells out to form the chamber. All the internal cavities, however, seem to have been occupied with the living sarcode, and an intimate connection was maintained between them by means of innumerable parallel tubuli, which everywhere pass from one surface to another, and which permitted the passage of the sarcode as freely as do the minute pores or foramina of the living foraminifera.

The name is given to them from their resemblance to coins. In Egypt, where the whole of the Mokkadam mountains, from the stone of which the pyramids were built, is formed of them, they are called by the natives "Pharaoh's Pence."

NUN, a member of a religious order of women. The etymology of this name is a subject of some controversy, but there seems every reason to believe that it is from a Coptic or Egyptian root, which signifies "virgin." It is found in use as a Latin word as early as the time of St. Jerome (*Ep. to Eustachius*, p. 22, c. 6). The general characteristics of the religious orders will be found under the head MONACHISM (q.v.), and under those of the several orders. It is only necessary here to specify a few particulars peculiar to the religious orders of females. Of these the most striking perhaps is the strictness in the regularly authorized orders of nuns of the "cloister," or inclosure, which no extern is ever permitted to enter, and beyond which the nuns are never permitted to pass, without express leave of the bishop. The superiors of convents of nuns are called by the names abbess, prioress, and, in general, mother superior. They are, ordinarily speaking, elected by chapters of their own body, with the approval of the bishop, unless the convent be one of the class called exempt houses, which are immediately subject to the authority of the Holy See. The ceremony of the solemn blessing or inauguration of the abbess is reserved to the bishop, or to a priest delegated by the bishop. The authority of the abbess over her nuns is very comprehensive, but a precise line is drawn between her powers and those of the priestly office, from which she is strictly debarred. The name of nun is given in general to the sisters of all religious congregations of females who live in retirement and are bound by rule; but it is primitively and properly applicable only to sisters of the religious orders strictly so called. See MONACHISM.

NUNC DIMIT'TIS, the name given to the canticle of Simeon (Luke ii., 29-32), which forms part of the compline office of the Roman breviary, and is retained in the evening service of the Anglican church when it follows the second lesson. On the great festivals in Lent, the music of this canticle is especially grand and imposing.

NUNCIO (Ital. *nunzio*, Lat. *nuncius*, a messenger), the name given to the superior grade of the ambassadors sent by the pope to foreign courts, who are all called by the general name of LEGATE (q. v.). A nuncio is an ambassador to the court of an emperor or king. The ambassador to a republic, or to the court of a minor sovereign, is called INTERNUNCIO.

NUNCU'PATIVE WILL is a will made by word of mouth. As a general rule, no will is valid unless it is in writing and signed by the testator; but in cases of soldiers and sailors, a verbal or noncupative will is held to be good, on the ground that there is often no time to draw up a formal will in writing.

NUNEATON, a small market-t. of England, in the county of Warwick, and 18 m. n. e. of the town of that name. It contains a small parish church in Gothic, and its free grammar school was founded by Edward VI. in 1558. Ribbons and cotton goods are manufactured. Pop. '71, 7,000.

NUÑEZ, ALVAR (CABECA DE VACA), 1490–1564; b. Spain, second in command to Pamfilo de Narvaez in the unfortunate expedition to Florida in 1527. After the latter was lost while attempting to make his way to Mexico, Nuñez, with a few other survivors of the expedition, succeeded in landing on the continent at some point w. of the Mississippi river, and went n. w. to a country supposed to have been what is now New Mexico. The party had endured great hardship on the journey, but were well cared for by friendly Indians, among whom they passed eight months. They then went on towards the s. w., and after terrible suffering, only Nuñez and three companions survived to arrive at the Spanish colonies on the Pacific. This was in 1536, eight years after the shipwreck of Narvaez. Nuñez went back to Spain, but in 1540 started for La Plata, of which he had been appointed governor. His vessel was wrecked, and he landed in Paraguay, which he at once began to explore, passing down the La Plata through the country of the Guaranís, to Asuncion, which he made his headquarters. He conquered several Indian tribes, but was at one time defeated, and soon afterward on the accusations of Domingo de Irala, his second in command, he was sent to Spain for trial, found guilty, and banished to Africa. Recalled by the king at the end of eight years, he was made judge of the supreme court of Seville, and continued in that office till his death. *The Shipwrecks of Alvar Nuñez*, with the *Commentaries of Alvar Nuñez*, written by his secretary, Fernandez, appeared at Valladolid in 1544. His story is found in an abridged form in Hakluyt's *Voyages*, and an English translation of the whole was published by Buckingham Smith at Washington in 1852.

NUNQUAM INDEBITATUS, a law term meaning, in an action for debt, a plea that the defendant never was indebted. By the Judicature act of 1875, the defendant is no longer allowed to deny generally the facts alleged by the plaintiff.

NUPHAR. See WATER-LILY, *ante*.

NURAGHE, the name of certain structures, of conical shape, in the island of Sardinia, rising 30 or 40 ft. above the ground, with two or three stories of domed chambers connected by a spiral staircase. Some are raised on basements of masonry or platforms of earth. They are made of granite limestone, basalt, porphyry, sandstone, and schist. Their entrances are small and low, and when they have chambers of two stories, the upper chamber is reached by the spiral staircase, which has loopholes to admit the light. The tops are supposed to have had a terrace. Although 3,000 of them exist, none are perfect. Their masonry is irregular, but not polygonal, and resembles the style of work called Asiatic. Like the round towers of Ireland, and other uninscribed monuments, their object and antiquity are enveloped in much doubt. They have been supposed to be the work of the Pelasgi, the Phenicians, or Carthaginians, and to have been ancient sepulchres, *Tholi* or *Daedalia*, constructed in heroic times. Skeletons, and other funeral paraphernalia, have been found in them. They have many points of resemblance to the "Burghs" or "Duns" on the northern shores of Scotland, of which the Burgh of Mousa, in Shetland, is perhaps the best example.—De la Marmora, *Voyage en Sardaigne*, tom. ii.; Petit Radel, *Nuraghes* (Paris, 1826–28); Micali, *Ant. Pop. Ital.* ii. pp. 43; Dennis, *Cities and Cem. of Etruria*, ii, pp. 161.

NUREDDIN'. See NOUREDDIN, *ante*.

NUREMBERG or NÜRNBERG (*Norimberga*, *Norica*), a fortified city of the Bavarian province of middle Franconia, situated in 49° 28′ n. lat., and 11° 5′ e. long. Pop. '71, 80,000; '75, 91,017. Nuremberg is one of the most remarkable and interesting cities of Germany, on account of the numerous remains of medieval architecture which it presents in its picturesque streets, with their gabled houses, stone balconies, and quaint carvings. No city retains a stronger impress of the characteristics which distinguish the wealthy burgher-classes in the middle ages, while its double lines of fortified walls, separated from each other by public walks and gardens, and guarded by 70 towers, together with the numerous bridges which span the Pegnitz, on whose banks the city is built, give it distinctive features of its own. Among the most remarkable of its numerous public buildings are the old palace or castle, commanding, from its high position, a glorious view of the surrounding country, and interesting for its antiquity, and for its gallery of paintings, rich in gems of early German art; the town-hall, which ranks amongst the noblest of its kind in Germany, and is adorned with works of Albert Dürer, and Gabriel Weyher; the noble Gothic fountain opposite the cathedral by Schonhofer, with its numerous groups of figures, beautifully restored in modern times; and many other fountains deserving notice. Of the numerous churches of Nuremberg, the following are the most remarkable: St. Lawrence, built between 1270–1478, with its beautiful painted-glass windows, its noble towers and door-way, and the celebrated stone pyx, completed in 1500, by Adam Kraft, after five years' assiduous labor; and the exquisite wood carvings of Veit Stoss; St. Sebald's, with its numerous fine glass-paintings and frescoes by Peter Visscher and other German masters; the cathedral, or Our Lady's, built in 1631, similarly enriched. Nuremberg is well provided with educational establishments, and besides a good gymnasium and polytechnic institution, has good schools of art, normal and other training colleges, a public library of 50,000 vols., galleries of art collections, museums, etc.; while the numerous institutions of benevolence are liberally endowed and well maintained. Although the glory of the foreign commerce of Nuremberg may be said to have been long extinct, its home trade, which is still of considerable importance, includes the specialties of metal, wood, and bone carvings, and children's toys and dolls, which find a ready sale in every part of Europe, and are largely exported to America and the east. In addition to its own industrial commerce, is the seat of a large transfer and exchange business, which owes much of its importance to the facilities of intercommunication afforded by the net-work of railway lines with which the city is connected.

Nuremberg was raised to the rank of a free imperial city by the Emperor Henry V., in 1219, previous to which time, Henry IV. had enobled 38 of the principal burgher families, who forthwith arrogated to themselves supreme power over the Nuremberg territory. In the 13th c., we find it under the title of a burg-graviate in the hands of the Hohenzollern family, who, in 1417, ceded for a sum of money all their territorial and manorial rights to the magistracy of the city. This measure put a stop to the feuds which had hitherto raged between the burggrafs and the municipality, and for a time

Nuremberg continued to grow rich with the fruits of the great internal trade which it had long maintained between the traders of the east and the other European marts of commerce. The discovery of the passage by the cape of Good Hope, by opening new channels of communication between Asia and Europe, deprived Nuremberg of its ancient monopoly. The thirty years' war completed the decay of the city, which suffered severely from both parties in turn. The ancient reputation of Nuremberg as a wealthy and loyal city of Germany secured to it, however, special consideration; and in 1803 when the imperial commissioners reorganized some of the dismembered parts of the old empire, it was allowed to retain its independence, with a territory of 488 sq.m., containing 40,000 inhabitants, and drawing a revenue of 800,000 guldens; but in consequence of the disputes in which the free city became involved with the king of Prussia, who had some hereditary claim on the ancient burg-graviate, Nuremberg, alarmed at the prospect of still greater embarrassments, entered into the Rhenish confederation, and as the result of this alliance, was transferred, in 1806, with the surrender of its entire domain and all rights of sovereignty, to the king of Bavaria.

NUREMBERG, Diets of, 1522–23, important church councils of the reformation. After the invasion of Hungary by Soliman the Turk the emperor Charles V. convened a diet at Nuremberg, Mar. 23, 1523, to concert measures against the Turks, and settle internal religious difficulties. The emperor wrote to pope Adrian VI., urging him to confirm the decisions of the diet, and to use his money to destroy the heresy of Luther. Pope Adrian sent his chamberlain with a brief to the elector of Saxony, requesting him in the next diet "to protect and maintain the dignity and majesty of the apostolic see, and with it the peace of christendom," as his ancestors had done. Frederick replied that while he chiefly sought the glory of God and the peace of the empire, Luther and his followers must be met with reason, not force. The pope then represented to Francis Chieregati, his legate at Nuremberg, that Luther and his adherents were not only heretics, but dangerous to the state, and therefore must be suppressed. In another brief to the elector he charged him with being the friend of heretics. He also forbid his protecting Luther under penalty of ecclesiastical and civil punishment. At the diet which convened Dec. 13, 1522, Hans von Plaunitz, a friend of Luther, represented Frederick. Chieregati, the pope's legate, presented a papal brief to the diet demanding that the Lutheran preachers should be arrested and sent to Rome to be judged. This the diet refused, and made a vigorous reply to the brief. Appearing again in 1523 before the diet the legate demanded the enforcement of the decrees of the diet of Worms against Luther's heresy, declaring at the same time that the bad state of the church was due to the laxity of discipline in the clergy, and also to the bad example of some of the popes. The pope also confessed freely the need of reformation in the church, and promised to do all in his power for its improvement. Both parties were displeased with these statements of the legate; the papal, because the pope confessed the evil condition of the church, and censured his predecessors; the reformers, ridiculing the promise of the pope to introduce reforms. A committee was appointed by the state to prepare a reply to the legate; and this favored the Protestant principles, declaring that the abuses of the Roman court, the immorality of the clergy, the violation of the concordats, etc., had been fully shown by Luther, making in all 81 different counts. The reply also demanded that a free council should be held at some city of Germany, engaging that Luther and his adherents should not make disturbance by preaching or writing. The legate, in reply, insisted on the execution of the terms of the edict of the diet of Worms. Philip von Feilitzsch, the envoy of the elector of Saxony, protested against the agreement that Luther and his followers should publish nothing until the meeting of the council. Luther also wrote to the elector Frederick, claiming the same freedom to defend himself that the opposite party had to attack him; that the stipulation not to publish until the settlement of the difficulties could not apply to the publishing of the Bible or the preaching of the gospel, as the word of God could not be bound. The acts of the diet disappointed the pope; the emperor disregarded his appeals, because of his interference in the affairs of France, and Adrian died of grief.

The condition of things in Germany and the change in the papal see led to another diet at Nuremberg, Nov. 11, 1523. Cardinal Lorenzo Campeggio was the legate of the new pope, Clement VII. The diet was opened Jan. 14, 1524. The majority showed itself opposed to the pope. They discussed the necessity of furnishing assistance to the king of Hungary, of contributing to the war against the Turks, and of removing the seat of government from Nuremberg to Esslingen. This displeased the emperor as well as the pope, and Hanart, in behalf of the emperor, and Campeggio for the pope, demanded the dissolution of the diet. Campeggio showed the danger to the empire in any departure from the ancient faith; the states referred him to the grievances complained of in a former diet. The legate replied that the pope had received no official communication of those grievances, and insisted on the carrying out of the edict of Worms. Frederick's representative declared that he had received no official communication of the edict of Worms; that the late diet had not forbidden evangelical preaching, and that its decisions could not be set aside without discussion. The diet dissolved April 18. The seat of government was removed to Esslingen, aid was granted to the king of Hungary and for the war against the Turks. The states decided also, that the pope should, with the assent of the emperor, cause a free council to be held in Germany as soon as possible, and that, in the meantime, another diet at Spires should specify the grievances of the princes against the pope, and decide on the manner of holding the aforementioned council; until then the princes should carefully watch all new doctrines and books, but see also that the gospel should be freely and peacefully preached and explained, as generally received by the church. The emperor was prevented by complications with France from much impeding the reformation. The pope's legate sought to organize a Roman Catholic league in opposition to the evangelical princes and states, and even attempted to gain over Melanchthon. The reformation rapidly gained ground. In 1542 and 1543 two other diets were held, but they were not very important. Political difficulties and dissatisfaction because the promised reforms had not been carried out, led to another diet, which was held Jan. 31, 1543, in which the Roman Catholics opposed all reform, and the other party acted with vigor. King Ferdinand urged the prosecution of the war against the Turks with increased energy, of protecting Hungary and the neighboring regions, and of granting aid against the French, who had invaded the Netherlands. The evangelical princes and states presented to the king and to the imperial commissioners a list of their grievances. They complained of the peace of Nuremberg having been broken by the imperial chamber of justice, and of the promised reforms not having been carried out. They required also religious liberty. All the questions gave rise to numerous debates, which related mostly to the political affairs of the empire. The proposed council, which was to be held at Trent, the evangelical party refused to accept, and, as no sure guarantees of peace were given them, they declined to take any further part in the proceedings of the diet. The resolutions of the diet were therefore passed without the participation of the reform party.

NURSE, a colloquial name given to several species of sharks. In New England it is used of the *somniosus microcephalus;* in Florida to the *ginglymostoma cirratum;* and in the Pacific to the *cestracion philippi.*

NURSE, Military. In continental armies the "sisters of charity" usually carry their mission of mercy into the military hospitals. Protestant England having no such organization to fall back upon, the soldiers have been dependent on the regular male hospital attendants for their care during sickness, or when suffering from wounds. The Crimean campaign, however, disclosed so melancholy a picture of the want of women's co-operation, that a band of self-sacrificing ladies, headed by Miss Nightingale (q.v.), proceeded to Turkey, and were soon acknowledged as messengers of health and life by the unfortunate wounded. The example thus set has not been without effect. In the Franco-German war of 1870–71 lady-nurses of various nations ministered in all the military hospitals, and the like took place during the Russo-Turkish war of 1877–78.

NURSERY, a garden or portion of a garden devoted to the raising of young plants, to be afterward planted elsewhere. The ripening of garden-seeds for sale is generally also an important part of the trade of the public nurseryman. Many culinary vegetables are very commonly raised from seed in public nurseries, and sold as young plants; the trouble of raising them in small gardens being found too great, although, when there is no public nursery at hand, even the cottage gardener may be compelled to undertake this trouble for himself, in order to procure a supply of young kale, cabbage, cauliflower, etc., in fresh and healthful condition. Many flowering plants, as wallflower, stock, sweet-william, etc., are also raised and sold by nurserymen. Another great use of the nursery is the rearing of fruit-trees. In the nursery the stocks are raised from seed, the grafting is performed, and the training of the young tree, whether for standard, espalier, or wall tree, is begun. As, with regard to fruit-trees, the selection of grafts is of the utmost importance, the reputation of the nurseryman is particularly to be considered by the purchaser; nor is there any trade in which this is more generally necessary, months, or sometimes years elapsing before the quality of the goods purchased can be experimentally ascertained. The principal, and many of the smaller towns of Britain are well supplied with public nurseries, which is the case also in many countries of continental Europe and in North America. Some of these nurseries are on a very great scale, as those of Messrs. Loddige of London, Lawson of Edinburgh, and Booth of Hamburg. The largest nurseries, however, are very much devoted to the rearing of ornamental shrubs and trees, and of forest-trees. Plantations of forest-trees, even when very extensive, are now generally, although not always, made with plants obtained from public nurseries. The exertions made by nurserymen to obtain new plants from foreign countries, have contributed much, not only to the advancement of gardening in its various departments, and of arboriculture, but also of botany.—Much benefit also results from the exchange of the produce of the nurseries of different countries. Thus, bulbous roots are brought to Britain from Holland, from what may be described as nurseries specially devoted to them; roses and orange-trees are imported from the nurseries of France, etc. It often happens that seeds imported from climates more thoroughly adapted to the plants, produce better crops than those raised in a colder climate or under a cloudier sky

NUSAIRIEH, Nossairians or Ansonians. See Ansaries.

NUT, in popular language, is the name given to all those fruits which have the seed inclosed in a bony, woody, or leathery pericarp, not opening when ripe. Amongst the best known and most valuable nuts are the hazel-nut, Brazil nut, walnut, chestnut, and cocoa-nut, all of which are edible. Other nuts are used in medicine, and for purposes connected with the arts. Some of the edible nuts abound in a bland oil, which is used for various purposes.—In botany the term nut (*nux*) is used to designate a one-celled fruit, with a hardened pericarp, containing, when mature, only one seed. The *achenium* (q.v.) was by the older botanists generally included in this term. Some of the fruits to which it is popularly applied scarcely receive it as their popular designation. The hazel-nut is an excellent example of the true nut of botanists.—The name nut, without distinctive prefix, is popularly given in Britain to the hazel-nut, but in many parts of Europe to the walnut.

Many nuts have a considerable commercial value, from their being favorite articles of food; these are the hazel-nut and its varieties, the black Spanish, the Barcelona, the Smyrna, the Jerusalem filbert, and the common filbert; the walnut, chestnut, hickory, and pecan; the souari, the cocoa or coker nuts, and the Brazil or Para nut.

The Barcelona and black Spanish, as their names imply, are from Spain; the former is the commonest nut of our shops. About 120,000 bags, averaging 1¼ bushel each, or 150,000 bushels, are annually imported into Great Britain. The import value is about 33s. per bag. They are always kiln-dried when we receive them. This is not the case with the black Spanish, of which only about 12,500 three-bushel bags, or about 37,000 bushels, are imported in the beginning of the season, when their value is about 14s. per bushel. From the Black sea we receive annually about 68,000 bushels of hazel-nuts, worth 10s. per bushel, with from 500 to 1000 bags of the so-called Jerusalem and Mount Atlas filberts. Of chestnuts, from Leghorn, Naples, Spain, France, and Portugal, we receive annually about 20,000 bushels. The trade in walnuts is very uncertain, and probably never exceeds 5,000 bushels. Of the curious three-cornered or Brazil nut from Para and Maranham, the importation is also very irregular, varying from 300 to 1000 tons, or 1200 to 4,000 bushels per annum. About two millions of cocoa-nuts are also imported. The other kinds of nuts are too irregular in their importations to supply any reliable statistics. The annual value of all the nuts imported for use as fruit is computed at about £153,000.

NUTATION is a slight oscillatory movement of the earth's axis, which disturbs the otherwise circular path described by the pole of the earth round that of the ecliptic, known as the "precession of the equinoxes." It is produced by the same causes, viz. the attraction of the sun, moon, and planets (the attraction of the last mentioned being so small as to be quite imperceptible) upon the bulging zone about the earth's equator, though in this case it is the moon alone that is the effective agent. It also, for reasons which need not be given here, depends, for the most part, not upon the position of the moon in her orbit, but of the moon's node. If there was no precession of the equinoxes, nutation would appear as a small elliptical motion of the earth's axis, performed in the same time as the moon's nodes take to complete a revolution, the axes of the ellipse being respectively 18".5 and 18".7, the longer axis being directed towards the pole of the ecliptic. But this motion, when combined with the more rapid one of precession causes the pole of the earth's axis to describe a wavy line round the pole of the ecliptic.

The effect of nutation, when referred to the equator and ecliptic, is to produce a periodical change in the obliquity of the ecliptic, and in the velocity of retrogradation of the equinoctial points. It thus gives rise to the distinction of "apparent" from "mean" right ascension and declination, the former involving, and the latter being freed from the fluctuations arising from nutation. This motion is common to all the planets.

NUT-CRACKER, *Nucifraga* or *Caryocatactes*, a genus of birds of the family *corvidæ*, with a straight conical bill, both mandibles terminating in an obtuse point, and tail nearly square at the end. The form and characters are nearly similar to those of crows, but the habits are rather those of jays, and in some respects indicate an approach to woodpeckers. One species (*N. caryocatactes* or *C. nucifraga*) is occasionally seen in Britain, and is not uncommon in many parts of Europe and of Asia, particularly in mountainous regions covered with pines. It is about the size of a jackdaw, but has a longer tail. The plumage is light brown, speckled with white, except on the wings, rump, and tail, which are nearly black. The nut-cracker frequents the tops of high pines, and is a shy bird.

NUTGALL. See GALLS, *ante*.

NUT-HATCH, *Sitta*, a genus of birds of the family *certhiadæ*, having a straight conical or prismatic bill, short legs, the hind-toe very strong. They run up and down trees with great agility, moving with equal ease in either direction, and without hopping, so that the motion is rather like that of a mouse than of a bird. They feed on insects, in pursuit of which they examine the crevices, and remove the scales of the bark; also on seeds, as those of pines, and the kernels of nuts, to obtain which they fasten the nut firmly in some crevice of bark or other such situation, and peck at it until the shell is broken, so placing themselves that they sway not merely the head, but the whole body, to give force to the stroke. The English name is said to have been originall *nut-hack*. One species, the EUROPEAN NUT-HATCH (*S. Europæa*), is common in most parts of Europe, and is found in most of the wooded districts of England. Its whole length is about six inches.

If taken young, it is easily tamed, and becomes very familiar and amusing; but an old bird caught and put into a cage, is apt to kill itself by violently pecking to force a way out. It soon destroys the wood of a cage.—Other species are found in the east and in North America, where the genus is particularly abundant. Birds nearly allied are found in Australia.

NUTMEG. This well-known and favorite spice is the kernel—mostly consisting of the albumen—of the fruit of several species of *myristica*. This genus belongs to a natural order of exogens called *myristicaceæ*, which contains about forty species, all tropical trees or shrubs, natives of Asia, Madagascar, and America. They generally have red juice, or a juice which becomes red on exposure to air. The order is allied to *lauraceæ* The leaves are alternate and without stipules. The flowers are unisexual, the perianth generally trifid, the filaments united into a column. The fruit is succulent, yet opens like a capsule by two valves. The seed is nut-like, covered with a laciniated fleshy aril, and has an albumen penetrated by its membranous covering. The species of this order are generally more or less aromatic in all their parts; their juice is styptic and somewhat acrid; the albumen and aril contain both a fixed and an essential oil, and those of some species are used as spices. The genus *myristica* has the anthers united in a cylindrical column, and the cotyledons folded. The species which furnishes the greater part of the nutmegs of commerce is *M. fragrans* or *moschata;* but the long nutmeg (*M. fatua*), from the Banda isles, is now not uncommon in our markets. The common nutmeg-tree is about 25 ft. in height, with oblong leaves, and axillary few-flowered racemes; the fruit is of the size and appearance of a roundish pear, golden yellow in color when ripe. The fleshy part of the fruit is rather hard, and is of a peculiar consistence, resembling candied fruit; it is often preserved and eaten as a sweetmeat. Within is the nut, enveloped in the curious yellowish-red aril, the *Mace* (q.v.), under which is a thin shining brown shell, slightly grooved by the pressure of the mace, and within is the kernel or nutmeg. Up to 1796, the Dutch being the possessors of the Banda isles, jealousy prevented the nutmeg from being carried in a living state to any other place; but during the conquest and retention of the islands by the British, care was taken to spread the culture of this valuable spice, and plants were sent to Penang, India, and other places, where they are now successfully cultivated; indeed, they have now become established in the West India Islands, and both Jamaica and Trinidad produce excellent nutmegs. Brazil is also found favorable to their culture. The nutmeg is very liable to the attack of a beetle, which is very destructive, and it is a common practice to give them a coating of lime before shipping them to Europe, in order to protect them from its ravages. The Dutch or Batavian nutmegs are nearly always limed, but those from Penang are not, and are consequently of a greater value. The nutmeg yields, by expression, a peculiar yellow fat, called oil of mace, because, from its color and flavor, it was generally supposed to be derived from mace; and by distillation is obtained an almost colorless essential oil, which has very fully the flavor of the nutmeg. Her own settlements now furnish Great Britain with the greater portion of this spice, but some lots of Batavian also come into the market. The quantity imported may be stated as 300,000 pounds' weight, worth, in round numbers, £70,000.

Nutmegs are chiefly used as a spice; but medicinally they are stimulant and carminative. They possess narcotic properties, and in large doses produce stupefaction and delirium, so that they ought not to be used where affections of the brain exist or are apprehended.

Other species of *myristica* besides those already named yield nutmegs sometimes used, but of very inferior quality.—The fruits of several species of *lauraceæ* also resemble nutmegs in their aromatic and other properties; as the cotyledons of *Nectandra Puchury*, the Pichurim beans of commerce, and the fruit of *acrodiclidium camara*, a tree of Guiana, the camara or ackawai nutmeg. The clove nutmegs of Madagascar are the fruit of *agathophyllum aromaticum*, and the Brazilian nutmegs of *Cryptocarya moschata*. All these belong to the order *lauraceæ*. The Calabash nutmeg is the fruit of *monodora myristica*, of the natural order *anonaceæ*.

NUTRIA. See COYPU and RACOONDA.

NUTRITION. The blood which is carried by the capillaries to the several tissues of the body is the source from whence all the organs derive the materials of their growth and development; and it is found that there is direct proportion between the vascularity of any part and the activity of the nutrient operations which take place in it. Thus, in nervous tissue and muscle, in mucous membrane and in skin, a rapid decay and renovation of tissue are constantly going on, and these are parts in which the capillaries are the most abundant; while in cartilage and bone, tendon and ligament, the disintegration of tissue is comparatively slow, and the capillaries are much less abundant. Each elementary cell or particle of a tissue seems to have a sort of gland-like power not only of attracting materials from the blood, but of causing them to assume its structure, and participate in its properties. Thus, from the same common source, nerves form nervous tissue, muscles muscular substance, and even morbid growths, such as cancer, have an assimilating power.

Before entering further into the subject of nutrition, it is necessary to understand how it differs from the allied processes of development and growth. All these processes are the results of the plastic or assimilative force by which living bodies are able to form themselves from dissimilar materials (as when an animal subsists on vegetables, or when a plant grows by appropriating the elements of water, carbonic acid, and ammonia); but they are the results of this force acting under different conditions.

Development is the process by which each tissue or organ of a living body is first formed, or by which one, being already incompletely formed, is so changed in shape and composition as to be fitted for a function of a higher kind, or finally is advanced to the state in which it exists in the most perfect condition of the species.

Growth, which commonly concurs with development, and continues after it, is properly mere increase of a part by the insertion or superaddition of materials similar to those of which it already consists. In growth, properly so called, no change of form or composition occurs; parts only increase in weight, and usually in size; and if they acquire more power, it is only more power of the same kind as that which they before enjoyed.

Nutrition, on the other hand, is the process by which the various parts are maintained in the same general conditions of form, size, and composition, which they have already by development and growth attained. It is by this process that an adult person in health maintains for a considerable number of years the same general outline of features, and nearly the same size and weight, although during all this time the several tissues of his body are undergoing perpetual decay and renovation. In many parts this removal and renewal of the particles is evident. In the glands—the kidneys (q.v.), for example—the cells of which they are mainly composed are being constantly cast off; yet each gland maintains its form and proper composition, because for every cell that is thrown off a new one is produced. In the epidermis of the skin, a similar process is perpetually going on before our eyes. In the muscles a similar change may be readily traced, for, within certain limits, an increased amount of exercise is directly followed by an increased excretion of the ordinary products of the decomposition of the nitrogenous tissues—viz. urea, carbonic acid, and water. Again, after prolonged mental exertion, there is often a very marked increase in the amount of alkaline phosphates in the urine, which seems to show that in these cases there is an excessive oxidation of the phosphorus of the brain; and yet, in consequence of the activity of the reparative process, neither the muscles nor the brain diminish in size.

It may be regarded as an established fact in physiology that every particle of the body is formed for a certain period of existence in the ordinary conditions of active life, at the end of which period, if not previously destroyed by excessive exercise, it is absorbed or dies, and is cast off. (The hair and deciduous or milk teeth afford good illustrations of this law.) The less a part is exercised the longer its component particles appear to live. Thus Mr. Paget found that if the general development of the tadpole be retarded by keeping it in a cold, dark place, and if hereby the funtions of the blood corpuscles be slowly and imperfectly discharged, the animal will retain its embryonic state for several weeks longer than usual, and the development of the second set of corpuscles will be proportionally postponed, while the individual life of the corpuscles of the first set will be, by the same time, prolonged.

For the due performance of the function of nutrition certain conditions are necessary, of which the most important are—1, a right state and composition of the blood, from which the materials of nutrition are derived; 2, a regular and not far distant supply of such blood; 3, a certain influence of the nervous system; and 4, a natural state of the part to be nourished.

1. There must be a certain adaptation peculiar to each individual between the blood and the tissues. Such an adaptation is determined in its first formation, and is maintained in the concurrent development and increase of both blood and tissues. This maintenance of the sameness of the blood is well illustrated by the action of vaccine matter. By the insertion of the most minute portion of the virus into the system, the blood undergoes an alteration which, although it must be inconceivably slight, is maintained for several years; for even very long after a successful vaccination, a second insertion of the virus may have no effect, because the new blood formed after the vaccination continues to be made similar to the blood as altered by the vaccine matter. So, in all probability, are maintained the morbid states of the blood which exist in syphilis and many other chronic diseases; the blood once inoculated, retaining for years the taint which it once received. The power of assimilation which the blood exercises in these cases is exactly comparable with that of maintenance by nutrition in the tissues; and evidence of the adaptation between the blood and the tissues, and of the delicacy of the adjustment by which it is maintained, is afforded by the phenomena of symmetrical diseases (especially of the skin and bones), in which, in consequence of some morbid condition of the blood, a change of structure affects in an exactly similar way the precisely corresponding parts on the two sides of the body, and no other parts of even the same tissue. These phenomena (of which numerous examples are given in two papers by Dr. W. Budd and Mr. Paget in the 25th vol. of the *Medico-chirurgical Transactions*) can only be explained on the assumption—1st, of the complete and peculiar identity in composition in corresponding parts of opposite sides of the body; and 2dly, of so precise and complete an adaptation between the blood and the several parts of each tissue, that a morbid material being present in the blood, may destroy its fitness for the nutrition of one or

two portions of a tissue, without affecting its fitness for the maintenance of the other portions of the same tissue. If, then, the blood can be fit for the maintenance of one part, and unfit for the maintenance of another part of the same tissue (as the skin or bone), how precise must be that adaptation of the blood to the whole body, by which in health it is always capable of maintaining all the different parts of the numerous organs and tissues in a state of integrity.

2. The necessity of an adequate supply of appropriate blood in or near the part to be nourished, is shown in the frequent examples of atrophy of parts to which too little blood is sent, of mortification when the supply of blood is entirely cut off, and of defective nutrition when the blood is stagnant in a part. The blood-vessels themselves take no share in the process, except as the carriers of the nutritive matter; and provided they come so near that the latter may pass by imbibition, it is comparatively unimportant whether they ramify within the substance of the tissue, or (as in the case of the non-vascular tissues, such as the epidermis, cornea, etc.) are distributed only over its surface or border.

3. Numerous cases of various kinds might be readily adduced to prove that a certain influence of the nervous system is essential to healthy nutrition. Injuries of the spinal cord are not unfrequently followed by mortification of portions of the paralyzed parts; and both experiments and clinical cases show that the repair of injuries takes place less completely in parts paralyzed by lesion of the spinal cord than in ordinary cases. Division of the trunk of the trifacial nerve has been followed by incomplete nutrition of the corresponding side of the face, and ulceration of the cornea is a frequent consequence of the operation.

4. The fourth condition is so obvious as to require no special illustration.

For furthur information on this most important department of physiology, the reader is referred to Mr. Paget's *Surgical Pathology*, or to his original lectures on nutrition, hypertrophy, and atrophy (published in vol. 89 of *The Medical Gazette*) or to the chapter on "Nutrition and Growth," in Kirke's *Handbook of Physiology*, which contains an excellent abstract of Mr. Paget's views, and to which we are indebted for the greater part of this article.

NUTRITION (*ante*). This subject is exhaustless. It comprehends all vital phenomena, for none of the functions of life are performed without involving replacement by living matter, and therefore nutrition. The subject of hygiene in all its aspects is connected with it, whether in eating, drinking, exercise, sleeping, or breathing. A change in each of these processes involves a corresponding change in the elaboration and appropriation of new material, and the disassimilation, or elimination of old, or its reconversion. This includes the functions of digestion (q.v.), chylification, sanguification, circulation (q v.), respiration (q.v.), assimilation, secretion (q.v.), metabolic change, and excretion. Nutrition, to be healthy, requires the respiration of pure air, the proper mastication of wholesome food, and its reception into the stomach. Not only must the food be wholesome, but a proper quantity, and no more, must be taken, and that at proper intervals. After its reception into the stomach a certain amount of attention to the requirements of the act of digestion is necessary for its normal performance. Too violent exercise immediately after, or the swallowing of too much fluid, particularly of cold water, will interfere with digestion and render it more or less imperfect. The system must be free from poisonous or malarious influences, and the mind unoccupied with distressing thoughts. As soon as digestion has progressed to some extent, and absorption of digested material has taken place, and consequently assimilation commenced, a certain amount of motion among the organs and tissues of the various parts of the body should be going on, so that the fluids which carry the nutritive materials may be sent on in their channels and thrown and drawn into the tissues they are destined to supply. This motion is principally produced by the exercises given by the ordinary duties of life, but those duties are so variously distributed among different persons that some get a great deal too much exercise, and others do not get near enough. In neither of these classes, therefore, can nutrition be perfectly normal. It is true that the tissues of the body are endowed with abundant, it may be said naturally superabundant, vitality, or restorative power, by which abnormal tendencies are overcome, except when they are too great. Then a certain degree of unhealthy nutrition will follow, and this is the general rule. There are few persons, especially in large cities whose inhabitants are so unfortunate as to be unable to secure sanitary policing of their neighborhoods, whose solids and fluids are not more or less impregnated with malarial poisons. The processes of nutrition in them require much more assistance than in those who live in more cleanly towns. Often some of the organs get into a condition far below the natural standard, and are composed of more or less degenerated tissue. This does not have the normal assimilative power and cannot derive from the blood, which itself is necessarily more or less abnormal, constituents for healthy regeneration. Under such circumstances various means require to be resorted to to assist the weakened tissues and forces. Medicines are often given, sometimes with a view of antagonizing certain of the malarial symptoms, of stimulating the nervous system to action, and of promoting excretion; often quinine is administered with benefit, it sometimes being the only available remedy unless the person removes to where the air is pure. But it is a sound axiom in medicine that recovery from disease is "regeneration of tissue." The real remedy for most cases of faulty nutrition, and which are included in the various forms of disease, is diet, and, when it can be had, exercise. But in many cases of sickness voluntary exercise is out of the question, and rest, as nearly absolute as possible, is demanded. In nearly all cases, however, of chronic disease, exercise, both voluntary and passive, is the only rational treatment having as its end complete recovery, or in other words, return to healthy nutrition. And all the exercise required in most cases of debility is not secured by mere movements of the limbs. The motion which is imparted by friction of various kinds, and by kneading the body so thoroughly that internal parts have their surfaces moved over each other, and alternations of pressure exerted so that the contents of the different vessels are propelled in their natural directions, is of very great advantage, and supplies a natural stimulus to the nerves, which regulate to a certain extent the nutritive forces.

It must be apparent that as the blood is the great carrier of nutritive material to all parts of the body, it is of the highest importance that it should be in a perfectly healthy condition, and this implies that all the secreting and excreting glands shall take from it all that it has borne away of effete matter from parts through which it has passed, and further elaborate all that is retained. But that these organs shall be able to do this, the blood itself must furnish them with the proper materials. There is therefore an intimate interdependence between the blood and every organ, and also between each organ and every other. The blood must have its normal quantity of fibrin (q.v.), of hemoglobine (q.v.), of iron, and of alkaline salts. If these are deficient, or any one of them, they must be supplied either in the food or in the form of medicine. Of great importance to nutrition are the lymphatic glands and the lymphatic system of vessels. (See LYMPH and LYMPHATICS, *ante.*) The liver (q.v.), the most important gland in all the body, if poisoned by malaria, or otherwise, can neither perform its biliary nor its glycogenic functions, nor can the cholesterine, which has been brought to it as a product of nerve dissassimilation, be properly separated from the blood or combined with the bile. The ductless glands exercise important offices in the elaboration of the blood. It has not been precisely determined what they do, or all that they do, but the spleen (q.v.) probably acts a part in renovating blood corpuscles, and is a sort of store-house of nutritive material. One of the quite constant effects of a miasm upon the human system is enlargement of the spleen. Thus we see an example in this single organ of the disturbing influences of malarial poison upon nutrition. The evolution of vital force is generally spoken of as the great purpose of nutrition, but perhaps it would be more comprehensive to say that the great purpose is the reparation of the organism and the keeping it in a normal condition that it may be the instrument for the transmission of force. See DIET and FOOD AND DRINK, *ante.*

NUTTALL, THOMAS, 1786–1859, b. England; apprenticed to a printer, but came to the United States and devoted himself to the study of natural history. He made a scientific exploration of the great lakes and the n. tributaries of the Mississippi. In 1810 he went up the Missouri to the Mandan villages, and in 1819 he traveled through the country drained by the Arkansas river. He published an account of his journey in 1821, under the title of *A Journal of Travels into the Arkansas Territory.* He also explored the Pacific coast, upon the natural history of which he published a number of papers. In 1822 he became professor of natural history and curator of the botanic garden at Harvard college. His most important books are *A Manual of the Ornithology of the United States and Canada,* 1834, and *The North American Sylva,* 1842–49. He left his professorship in 1834, and finally settled in England, where an estate had been given him on condition of his living on it.

NUX VOMICA is the pharmacopœial name of the seed of *strychnos nux vomica,* or *poison nut.* The following are the characters of these seeds, which are imported from the East Indies: "Nearly circular and flat, about an inch in diameter, umbilicated and slightly convex on one side, externally of an ash-gray color, thickly covered with short satiny hairs, internally translucent, tough, and horny, taste intensely bitter, inodorous."—*The British Pharmacopœia,* p. 99.

For the genuine characters, see the article STRYCHNOS. The nux vomica tree is a native Coromandel, Ceylon, and other parts of the East Indies. It is a tree of moderate size, with roundish-oblong, stalked, smooth leaves, and terminal corymbs. The fruit is a globular berry, about as large as a small orange, one-celled, with a brittle shell, and several seeds lodged in a white gelatinous pulp. The bark is known as *false angostura bark,* having been confounded with angostura bark, in consequence of a commercial fraud, about the beginning of the present c.; but its properties are very different, as it is very poisonous.

The seeds contain (in addition to inert matters, such as gum, starch, woody fiber, etc.) three alkaloids closely related to each other, which act as powerful poisons on the animal frame, and speedily occasion violent tetanic convulsions and death. These alkaloids or bases are named *strychnia*, *brucia*, and *igasuria,* and exist in the seeds in combination with lactic and strychnic (or igasuric) acid. For a good method of obtaining pure strychnia, which is by far the most important of the three bases, the reader is referred to p. 328 of *The British Pharmacopœia.*

Strychnia ($C_{42}H_{22}N_2O_4$) occurs "in right square octahedrons or prisms, colorless and inodorous, scarcely soluble in water, but easily soluble in boiling rectified spirit, in ether, and in chloroform. Pure sulphuric acid forms with it a colorless solution, which, on the addition of bichromate of potash, acquires an intensely violet hue, speedily passing through red to yellow."—*Op. cit.* In nitric acid, it ought, if pure, to form a colorless solution; if the solution is reddish, it is a sign that brucia is also present. Strychnia combines with numerous acids, and forms well-marked salts, which are amenable to the same tests as the base itself.

Brucia ($C_{46}H_{26}N_2O_8 + 8$ Aq) is insoluble in ether, but more soluble in water and in strong alcohol than strychnia; and it is the most abundant of the three alkaloids in nux vomica. It acts on the animal economy similarly to but much less actively than strychnia, from which it may be distinguished not only by its different solubility, but by the red color which is imparted to it by nitric acid, and which changes to a fine violet on the addition of protochloride of tin. Like strychnia, it forms numerous salts.

Igasuria seems closely to resemble brucia in most respects. Little is known regarding *igasuric acid*.

Strychnia, brucia, and igasuria, occur not only in nux vomica, but in the seeds of *strychnos ignatii* (St. Ignatius's beans), and in the seeds and other parts of several plants of the genus *strychnos*. The amount of strychnia present in these substances varies from 0.5 to 1.5 per cent.

Nux vomica, according to the experiments of Marcet, acts on vegetables as a poison. His experiments were, however, confined to the haricot bean and the lilac. It is poisonous in a greater or lesser degree to most animals, though larger quantities are required to kill herbivorous than carnivorous animals. Thus, a few grains will kill a dog, but some ounces are required to destroy a horse. It is believed, however, that the bird called *buceros rhinoceros* eats the nuts with impunity; and a peculiar kind of *acarus* lives and thrives in the extract of the nuts. Dr. Pereira describes three degrees of the operation of this substance on man. 1. In very small doses, its effects are tonic and diuretic, and often slightly aperient. 2. In larger doses, there is a disordered state of the muscular system; the limbs tremble; a slight rigidity or stiffness is felt when an attempt is made to put the muscles in action; and the patient experiences a difficulty in keeping the erect posture. If the use of the medicine be continued, these effects increase in intensity, and the voluntary muscles are thrown into a convulsed state by very slight causes, as, for example, by inspiring more deeply than usual, or even by turning in bed. It is remarkable that in paralysis the effects are most marked in the paralyzed parts. 3. In poisoning doses, the symptoms are tetanus and asphyxia, followed by death. After swallowing a large dose of strychnia (on which the poisonous effects of nux vomica essentially depend), the following phenomena occurred in a case recorded by Taylor in his *Medical Jurisprudence:* "A young man, aged seventeen, swallowed forty grains of strychnia. The symptoms came on in about a quarter of a hour; lock-jaw and spasmodic contraction of all the muscles speedily set in, the whole body becoming as stiff as a board; the lower extremities were extended and stiff, and the soles of the feet concave. The skin became livid, the eyeballs prominent, and the pupils dilated and insensible; the patient lay for a few minutes without consciousness, and in a state of universal tetanus. A remission occurred, but the symptoms became aggravated, and the patient died asphyxiated from the spasm of the chest in about an hour and a half after taking the poison." It is difficult to say what is the smallest dose that would prove fatal to an adult. Thirty grains of the powdered nuts, given by mistake to a patient, destroyed life. Three grains of the extract have proved fatal; and in a case quoted by Taylor (*op. cit.*), half a grain of sulphate of strychnia caused death in 14 minutes.

The preparations of nux vomica are the powdered nuts, the extracts, the tincture, and strychnia; the alkaloid being usually preferable, in consequence of its more constant strength. In various forms of paralysis, especially where there is no apparent lesion of structure, nux vomica is a most successful remedy; although there are cases in which it is positively injurious. It is also of service in various affections of the stomach, such as dyspepsia, gastrodynia, and pyrosis. The average dose of the powder is two or three grains, gradually increased; that of the tincture, 10 or 15 minims; and that of the extract half a grain, gradually increased to two or three grains The dose of strychnia, when given in cases of paralysis, is at the commencement one-twentieth of a grain three times a day; the dose being gradually increased, till slight muscular twitchings are observed. For gastric disorders, a still smaller dose is usually sufficient, as, for example, one-fortieth of a grain.

NYACK, a village in Rockland co., N. Y., on the Hudson river, 28 m. n. of New York, on the Northern railroad of New Jersey; pop. '70, 6,750. It is connected with New York city by steamboat, and with Tarrytown by ferry. It has churches, a female seminary, two newspapers, a number of summer hotels, etc

NYAM-NYAM, a tribe of negroes in n. central Africa, s. of the country of Bongos, between 4° and 6° n. lat. and 24° and 29° e. long. Schweinfurth, who visited their country in 1870, describes them as cannibals, living in cone-shaped straw huts, and possessing some skill in the manufacture of iron and earthen wares. The number of their chiefs is large, and their authority almost absolute, but in every village there is a public place for the consideration and decision of public questions. They are thought by Schweinfurth to have made a conquest of their present territory within a quite recent period. Though cannibals, they are more civilized than the surrounding tribes.

NYAN'ZA, VICTORIA, a great fresh-water lake in central Africa, discovered by capt. Speke in 1858, explored by Speke and Grant in 1862. The most authentic information that we have about the Victoria Nyanza is, however, derived from the exploration and circumnavigation of it by Stanley in 1875. The native name, Nyanza, signifies "the water." Its southern point is in lat. 2° 44′ s., long. 33° east. Its northern shore runs nearly parallel to the equator, and is about 20 m. to the n. of it. It is estimated to be about 220 m. in length, and 180 in breadth. It is of no great depth; the surface is about 3,800 ft. above sea-level. There are a number of islands near its shores, the chief of which are Ukerewe in the s.e., and Sasse in the north-west. At its n.e. extremity, lake Baringo, described by the natives as a long narrow basin, seems to be connected with the Victoria Nyanza by a narrow channel. The countries on the w. shores of the lake enjoy a mild and genial climate, and the rainfall is below that of many parts of Britain, being only 49 inches. M'tesa, king of Uganda, seems to be the most powerful monarch on the shores of the lake, his sway extending over a large portion of the northern and western coasts. His subjects possess a considerable degree of civilization. The most considerable tributary of the Victoria Nyanza is the Shimiyu (see NILE), which flows into its southern extremity in long. 33° 33′ east. The Nile emerges from the n. end of the Victoria Nyanza at Napoleon bay, precipitating itself over the Ripon falls. North-west from lake Nyanza lies what Speke called Lúta N'Zigé lake, which was described as a narrow reservoir about 230 m. long, through the northern end of which the Nile passes. This lake is now known as the Albert Nyanza (q.v.).

NYAN'ZA (*ante*). See AFRICA.

NYAS'SA, or NYANJA (apparently identical with name N'yanza), another lake in the interior of Africa, which Dr. Livingstone discovered in 1861 by ascending the river Shiré (q.v.). The southern end of the Nyassa, or Star Lake, is in lat. 14° 25′ s., and its northern end extends to the parallel of 9° 20′ south. The lake is upwards of 300 m. long, its average breadth being 26, and is 1300 ft. above sea-level. The first representatives of a mission on Nyassa, founded in honor of Dr. Livingstone, carried with them in sections a steamer of steel plates, which was successfully launched on the lake in 1875. None of the rivers flowing into Nyassa are navigable. The lake is in most parts very deep—in many places over 100 fathoms. To the east is a range of mountains 100 miles long, and ranging from 10,000 to 12,000 ft. over the lake. The scenery of Nyassa is described as grand in the extreme, though much of the land surrounding it is low and marshy. The population of its shores, once dense, has been sorely scourged by the slave-trade. Something had previously been known about this lake under the name of the Maravi; but the accounts were so vague that latterly it was omitted from the maps of Africa.

NYÂYA (from the Sanskrit *ni*, into, and *áya*. going, a derivative from *i*, to go; hence. literally, "entering," and, figuratively, "investigating analytically") is the name of the second of the three great systems of ancient Hindu philosophy; and it is apparently so called because it treats analytically, as it were, of the objects of human knowledge, both material and spiritual, distributed by it under different heads or topics; unlike, therefore. the *vedánta* (q.v.) and *sánkhya* (q.v.), which follow a synthetic method of reasoning, the former of these systems being chiefly concerned in spiritual and divine matters, and the latter in subjects relating to the material world and man. The Nyâya consists, like the two other great systems of Hindu philosophy (see MÎMÂNSÂ and SÂNKHYA), of two divisions. The former is called NYÂYA (proper), and will be exclusively considered in this article; the other is known under the name of VAIS'ESHIKA (q.v.). With the other systems or philosophy, it concurs in promising beatitude—that is, final deliverance of the soul from re-birth or transmigration—to those who acquire truth. which, in the case of the Nyâya, means a thorough knowledge of the principles taught by this particular system.

The topics treated of by the Nyâya are briefly the following: 1. The *pramán'a*. or instruments of right notion. They are: *a*. Knowledge which has arisen from the contact of a sense with its object; *b*. Inference of three sorts (*à priori*, *à posteriori*, and from analogy); *c*. Comparison; and *d*. Knowledge, verbally communicated, which may be knowledge of "that whereof the matter is seen," and knowledge of "that whereof the matter is unseen" (revelation). 2. The objects or matters about which the inquiry is concerned (*prameya*). They are: *a*. The *Soul* (*âtman*). It is the site of knowledge or sentiment, different for each individual coexistent person, infinite, eternal etc. Souls are therefore numerous, but the supreme soul is one; it is demonstrated as the creator of all things. *b*. *Body* (*s'arîra*). It is the site of action, of the organs of sensation, and of the sentiments of pain or pleasure. It is composed of parts, a framed substance, not inchoative, and not consisting of the three elements, earth, water, and fire. as some say, nor of four or all the five elements (viz. air and ether in addition to the former), as others maintain, but merely earthy. *c*. *Organs of sensation* (*indriya*); from the elements, earth, water, light, air, and ether, they are smell, taste, sight, touch, and hearing. *d*. *Their objects* (*artha*). They are the qualities of earth, etc.—viz. odor, savor. color, tangibility, and sound. *e*. *Understanding* (*buddhi*), or *apprehension* (*upalabdhi*), or *conception* (*jnâna*), terms which are used synonymously. It is not eternal, as the Sânkhya maintains, but transitory. *f. The organ of imagination and volition* (*manas*). Its property is the not giving rise simultaneously to more notions than one. *g. Activity* (*pravr'itti*), or that which originates the utterances of the voice, the cognitions of the understanding, and the gestures of the body. It is therefore oral, mental, or corporeal, and the reason of all worldly proceedings. *h. Faults* or *failings* (*dosha*), which cause activity—viz. affection, aversion, and bewilderment. *i. Transmigration* (*pretyabhâva*, literally, the becoming born after having died), or the regeneration of the soul, which commences with one's first birth, and ends only with final emancipation. It does not belong to the body, because the latter is different in successive births, but to the soul, because it is eternal. *k. Fruit* or *retribution* (*phala*), or that which accrues from activity and failings. It is the consciousness of pleasure or of pain. *l. Pain* (*duh'kha*), or that which has the characteristic mark of causing vexation. It is defined as "the occurrence of birth," or the originating of "body," since body is associated with various kinds of distress. Pleasure is not denied to exist, but, according to the Nyâya, it deserves little consideration, since it is ever closely connected with pain. *m. Absolute deliverance* or *emancipation* (*apavarga*). It is annihilation of pain, or absolute cessation of one's troubles once for all.

After (1) "instruments of right notion," and (2) "the objects of inquiry," the Nyâya proceeds to the investigation of the following topics.

3. *Doubt* (*sam's'aya*). It arises from unsteadiness in the recognition or non-recognition of some mark, which, if we were sure of its presence or absence, would determine the subject to be so or so, or not to be so or so; but it may also arise from conflicting testimony. 4. *Motive* (*prayojana*), or that by which a person is moved to action. 5. *A familiar case* (*dr'ish't'ânta*), or that in regard to which a man of an ordinary and a man of a superior intellect entertain the same opinion. 6. *Tenet* or *dogma* (*siddhânta*). It is either "a tenet of all schools," i.e., universally acknowledged, or "a tenet peculiar to some school," i.e., partially acknowledged; or "a hypothetical dogma," i.e., one which rests on the supposed truth of another dogma; or "an implied dogma," i.e., one the correctness of which is not expressly proved, but tacitly admitted by the Nyâya. 7. The different members (*avayava*) of a regular argument or *syllogism* (*nyâya*). 8. *Confutation* or reduction to absurdity (*tarka*). It consists in directing a person who does not apprehend the force of the argument as first presented to him, to look at it from an opposite point of view. 9. *Ascertainment* (*nirn'aya.*) It is the determination of a question by hearing both what is to be said for and against it, after having been in doubt. The three next topics relate to the topic of controversy, viz. 10. *Discussion* (*vâda*), which is defined as consisting in the defending by proofs on the part of the one disputant, and the controverting it by objections on the part of the other, without discordance in respect of the principles on which the conclusion is to depend; it is, in short, an honest sort of discussion, such, for instance, as takes place between a preceptor and his pupil, and where the debate is conducted without ambition of victory. 11. *Wrangling* (*jalpa*), consisting in the defence or attack of a proposition by means of tricks, futilities, and such like means; it is therefore a kind of discussion where the disputants are merely desirous of victory, instead of being desirous of truth. 12. *Cavilling* (*vitan'd'â*), when a man does not attempt to establish the opposite side of the question, but confines himself to carping disingenuously at the arguments of the other party. 13. *Fallacies*, or semblances of reasons (*hetvâbhâsa*), five sorts of which are distinguished, viz. the erratic, the contradictory, the equally available on both sides, that which, standing itself in the need of proof, does not differ from that which is to be proved, and that which is adduced when the time is not that when it might have availed. 14. *Tricks*, or unfairness in disputation (*chhala*), or the opposing of a proposition by means of assuming a different sense from that which the objector well knows the propounder intended to convey by his terms. It is distinguished as verbal misconstruing of what is ambiguous, as perverting, in a literal sense, what is said in a metaphorical one, and as generalizing what is particular. 15. *Futile objections* (*jâti*), of which twenty-four sorts are enumerated; and, 16. Failure in argument or reason of defeat (*nigraha-sthâna*), of which twenty-two distinctions are specified.

The great prominence given by the Nyâya to the *method*, by means of which truth might be ascertained, has sometimes misled European writers into the belief, that it is merely a system of formal logic, not engaged in metaphysical investigations. But though the foregoing enumeration of the topics treated by it could only touch upon the main points which form the subject-matter of the Nyâya, it will sufficiently show that the Nyâya intended to be a complete system of philosophical investigation; and some questions, such as the nature of intellect, articulated sound, etc., or those of genus, variety, and individual, it has dealt with in a masterly manner, well deserving the notice of western speculation. That the atomistic theory has been devolved from it, will be seen under the article VAIS'ESHIKA. On account of the prominent position, however, which the *method* of discussion holds in this system, and the frequent allusions made by European writers to a Hindu syllogism, it will be expedient to explain how the Nyâya defines the "different members of a syllogism" under its seventh topic. A regular argument consists, according to it, of five members—viz. *a.* the proposition (*pratijnâ*), or the declaration of what is to be established; *b.* the reason (*hetu*), or "the means for the establishing of what is to be established;" *c.* the *example* (*udâharan'a*), i.e. some familiar case illustrating the fact to be established, or, inversely, some familiar case illustrating the impossibility of the contrary fact; *d.* the application (*upanaya*), or "restatement of that in respect of which something is to be established;" and *e.* the conclusion (*nigamana*), or "the re-stating of the proposition because of the mention of the reason." An instance of such a syllogism would run accordingly thus: *a.* This hill is fiery, *b.* for it smokes, *c.* as a culinary hearth, or (inversely) not as a lake, from which vapor is seen arising, vapor not being smoke, because a lake is invariably devoid of fire; *d.* accordingly, the hill is smoking; *e.* therefore, it is fiery.

The founder of the Nyâya system is reputed under the name of *Gotama*, or, as it also occurs, *Gautama* (which would mean a descendant of Gotama). There is, however, nothing as yet known as to the history of this personage or the time when he lived, though it is probable that the work attributed to him is, in its present shape, later than the work of the great grammarian Pân'ini. It consists of five books or *Adhyâyas*, each divided into two "days," or diurnal lessons, which are again subdivided into sections or topics, each of which contains several aphorisms, or *Sûtras*. See SÛTRA. Like the text-books of other sciences among the Hindus, it has been explained or annotated by a triple set of commentaries, which, in their turn, have become the source of more popular or elementary treatises.—The Sanskrit text of the Sûtras of Gotama, with a commentary by *Vis'wanâtha*, has been edited at Calcutta (1828); and the first four books, and part of the fifth, of the text, with an English version, an English commentary, and extracts from the Sanskrit commentary of Vis'wanâtha, by the late Dr. J. R. Ballantyne (Allahabad, 1850–54). This excellent English version and commentary, and the celebrated Essay on the Nyâya, by H. T. Colebrooke (*Transactions of the Royal Asiatic society*, vol. i. Lond. 1827; and reprinted in the *Miscellaneous Essays*, vol. i. Lond. 1837), are the best guide for the European student who, without a knowledge of Sanskrit, would wish to familiarize himself with the Nyâya system.

NYBORG, a t. in Denmark, 16 m. s.e. of the city of Odense on the e. coast of Fünen, an island of the Baltic; pop. about 4,500. It is fortified, has a strong citadel, and here the Sound dues were paid by passing ships before the exclusive right of Denmark to the entrance of the Baltic was extinguished by purchase. The place contains ruins of the ancient palace of the kings of Denmark, a hospital, infirmary and dockyards. Near the walls occurred, in 1659, the great victory of the Danes over the Swedes.

NYCTAGINA'CEÆ, a natural order of exogenous plants, consisting partly of herbaceous plants, both annual and perennial, and partly of shrubs and trees. Lindley ranks them in his *Chenopodal alliance*. The flowers are either clustered or solitary, and either the cluster or the flower often has an involucre, which is often gayly colored. The perianth is tubular, plaited in bud, colored; the limb entire or toothed, deciduous. The stamens are equal in number to the lobes of the perianth. The ovary is superior, with one ovule, and one style. The fruit is a thin *caryopsis*, inclosed within the enlarged and indurated base of the perianth. There are about 100 known species, natives of warm countries. Some have flowers of considerable beauty, as those of the genus *mirabilis*, known in our gardens as *Marvel of Peru*, one of which, *M. Jalapa*, was at one time erroneously supposed to produce jalap. The roots of many are fleshy, purgative, and emetic. Those of *Boerhaavia paniculata* are used instead of ipecacuanha both in Guiana and in Java.

NYCTALO'PIA AND HEMERALOPIA. Terms employed for affections of the eye, and which have been indiscriminately employed. Mr. Lawrence, an English surgeon, and one of the pioneers in scientific ophthalmology, says "A great confusion has arisen in the application of these learned terms, each word being nearly as often used to express one affection as the other. Hippocrates used the term hemeralopia to denote night-blindness, and we may as well follow his example." And this is good etymology, for nyctalopia signifies "I see by night," while hemeralopia signifies "I see by day." Still it is not uncommon for nyctalopia to be defined as "night-blindness." "Hemeralopia," says Mr. Lawrence, "is that state of vision in which the patient sees well during the day, but imperfectly as twilight comes on; and when the affection is fully formed he loses his sight entirely at the approach of night, not being able to see a lighted candle brought close to the eye. In the commencement of the affection the person can see by moonlight, or when the room is lighted by a candle, but as it proceeds he can discern nothing after sunset; in the morning vision returns. There is no unnatural appearance in the eye; indeed if a person can see perfectly during the day, the organ can have undergone no important change (structural). There is little increased irritability in the commencement, but as the affection proceeds the pupil becomes rather dilated. The duration of the disease varies from one night to six or twelve months, or even longer. More generally it lasts from two weeks to three or six months, when left to itself. Relapses are frequent so long as persons remain exposed to the exciting cause, which seems to be the exhaustion of the power of the retina by exposure to strong light during the day." The disease is most prevalent in hot climates, and where there is much glare of sunlight, as in the East and West Indies. It is not also infrequent in high latitudes where the snow reflects the sun's rays for a great many hours during the day. Dr. Matthew Guthrie states that peasants in the interior of Russia are subject to it, where it is called *kieritsha slepota*, or hen blindness, and occurs during the harvest in June and July. He also says that several hundred Russian soldiers in the war in Finland were attacked by the affection. It has been recorded as occurring epidemically, and an instance is related in the 8th vol. of the *Dublin Journal* of medical and chemical science of such an epidemic among some Prussian soldiers stationed on the Rhine; but Mr. Lawrence observes that all the cases which he had seen commenced in the East or West Indies and were brought to England. Mackenzie, another high British authority, says that the disease does not appear to be necessarily connected by any constitutional symptoms, and Mr. Bampfield, in the *British Medico-chirurgical Transactions*, states that of more than three hundred cases in his practice in different parts of the globe, but chiefly in the East Indies, all perfectly recovered. The prognosis is, therefore, very favorable. In some instances night-blindness, or hemeralopia, is congenital. Richter relates three cases in a family of nine children. The only abnormal appearance of the eyes was the excessive dilation of the pupils after sundown. When the account was given these children had reached the age of from 20 to 30 years, without any alteration in their sight. One of them had never seen any stars. Dr. Cunier, of Ghent, relates some remarkable cases of hereditary hemeralopia (*Annales de la société de médecine de Gand* 1840). In the official capacity of an army surgeon, in the case of a conscript claiming exemption from night-blindness, Dr. Cunier made an examination in the commune of Vendémain, near Montpellier, and reported upon information and observation that one Jean Nougaret was the first of the family known to be hemeralopic; his children, one daughter, and two sons, were all affected with night-blindness. The second generation included 16 individuals of whom ten were thus affected; in the third generation there were 14 out of 81; in the fourth 23 in 208; in the fifth, not then completed, 24 in 218; in the sixth, including 108 persons, there were 11. But one of the remarkable facts in the case, and worthy of much consideration by those studying the subject of heredity, because varying in this respect from most hereditary laws, is that among all these descendants, numbering more than 600, and of whom nearly one-seventh were affected with night-blindness, there was not a single case in those families where both parents were free from the affection; that is, there was no intermediate transmission. *Nyctalopia*, or "night-seeing" (day-blindness) is a state opposite to hemeralopia, and is a disease of a very different nature. Mr. Lawrence states that in opacity of the cornia, in certain forms of cataract, in incipient opacity of the lens, in central opacity of the capsule, in contractions of the pupil from prolapse of the iris, the patient will often see best in a weak light, and find vision very imperfect in a strong light. In scrofulous affections of the eyes (strumous ophthalmia) the intolerance to light amounts to blindness during the day, while in the evening, with a faint light the patient sees quite well. Albinos are frequently nyctalopic, the absence of pigmentum nigrum, rendering the eye extremely sensitive, from its want of absorptive power. Barron Larrey records a remarkable case of day blindness, occurring in an old man, one of the galley slaves at Brest, who had been shut up in a subterranean dungeon 33 years. He had become so affected that he could only see in a shady light. As this condition is generally accompanied with some observable affection of the ocular apparatus its treatment will vary with circumstances.

NYCTERIBIA, an extremely curious genus of insects, ranked in the order *diptera*, although very different from most of that order, and having neither wings nor balancers. Its nearest alliance is with *hippoboscidæ* (See FOREST FLY and SHEEP TICK), which it resembles particularly in parasitic habits, and in the retention of the eggs within the abdomen of the female, until they have not only been hatched, but have passed from the larva into the pupa state. The form, however, is so spider-like, that these insects were at first ranked among the *arachnida*. The few species known are all parasitic on bats, on which they run about with great activity. The head is very small, curiously affixed to the back of the thorax, and when the creature sucks the blood of the bat, upon which it lives, it places itself in a reversed position.

NYCTICEBINÆ, a sub-family of lemuroid monkeys. They are distinguished from the rest of the family by their very short tails. There are two African and two Asiatic genera. The African genera are *perodicticus*, or the potto, and *arctocebus*, or the angwantibo. The Asiatic genera are the slender lemur (*loris*), and the slow lemur (*nycticebus*). In all these four genera the fore-finger of each hand is short, and in the potto it is rudimentary, so that each hand has but three fingers. They are inactive during the day, but at night prowl stealthily among the branches in search of food, which consists principally of insects and small birds. They also eat eggs and fruit. When irritated during their period of repose in the day their motions are very slow, and they utter a cry similar to that of the American sloths. They have a very tenacious grasp, ascribed by some to a peculiar mechanical arrangement of the muscles and tendons by which the mere stretching of the leg causes the toes to flex and produce a tight grasp. Others attribute it to the power of continuing muscular contraction, and this idea seems to be strengthened by the observations of sir Anthony Carlisle, who injected the arterial system of a *nycticebus tardigradus* and found a very peculiar and abundant distribution of blood vessels to the limbs. The axillary artery divided into 23 equal-sized cylinders, surrounding the principal trunk, and passing down the arm, each cylinder was found distributed to an individual muscle in the fore-arm. A similar distribution takes place in the lower or hind limbs. In this species there is also a remarkable peculiarity in the tongue, which is double. Beneath the principle tongue, which somewhat resembles a cat's, there is another tongue, white-colored, narrow, and very sharp pointed, which is used with the upper tongue in catching flies and in eating, but which the animal has the power of retaining in the mouth while the other tongue is in use. Dental formula $i\,\frac{2-2}{2-2}$; $c\,\frac{1-1}{1-1}$; $pm\,\frac{3-3}{3-3}$; $m\,\frac{3-3}{3-3} = 36$. The limbs are nearly equal in size, the ears are short and rounded, the eyes large and staring, and placed close together.

NYE, a co. in s.e. Nevada, bounded on the e. by Utah, and on the s.w. by California, drained by Amargoza and Reese rivers, 24,000 sq.m., pop. '80, 1875—66 Chinese. The surface in the n. is made up of mountains and valleys running n. and south. The s. part is mostly elevated sterile table-land, sloping e. to the Colorado river and w. to California. In the valleys there are large tracts of land suitable for grazing and cultivation. The ordinary cereals are raised, and there is considerable live-stock. A rich vein of quartz is found in the mountain ranges, and there are many gold and silver mines. Co. seat, Belmont.

NYE, JAMES W., 1815–76; b. Madison co. N. Y., where he was reared on a farm, received a common school education, studied law and commenced practice. While quite young he was elected district attorney and co. judge. In 1846 he was the anti-slavery candidate for congress in the same district, and defeated. Then he removed to Syracuse. In 1860 he was state police commissioner in the city of New York; was appointed governor of Nevada by president Lincoln in 1861; when Nevada became a state he was elected a U. S. senator from it for six years, ending Mar. 3, 1873. As a public speaker he was distinguished for his contagious humor, and in private for his genial disposition. On his retirement from the senate his mind was impaired. He died at White Plains, N. Y., Dec. 25, 1876.

NYIREGYHAZA, a t. of Hungary, in the co. of Szabolcs, on the railway between Debreczin and Tokay. The trade in agricultural produce is considerable. Nyiregyhaza has salt, soda, and saltpeter works. There are mineral springs in the neighborhood. Pop. '69, 21,896.

NY'KERK, or NIEUWKERK, on the Veluwe, is a very flourishing and well-built t., near the Zuyder Zee, in the province of Gelderland, Netherlands, 25 m. n.w. of Arnheim. Pop. 8,000. It has a good harbor, which is connected with the sea by a wide canal of 1¼ m. in length. In the neighborhood are fine rich meadow-pastures and lands suited for all kinds of grain, tobacco, potatoes, etc. Tobacco is extensively grown; many cattle are raised; and a brisk trade carried on both with the surrounding country and Amsterdam, the market to which the cattle, tobacco, dairy, and other agricultural produce, together with much firewood are sent. Nykerk has a handsome Reformed church, a Roman Catholic chapel, a synagogue, orphan-house, and good schools. There are several manufactures carried on, which also give employment to the people. In Netherlands' church history, Nykerk is famed as the place where a great religious movement began at the middle of last century. The history of the movement, which spread throughout the land, contains all the marks of the later revivals in America, Scotland, and Ireland. See Ypey and Dermout's *Geschiedenis der Nederd. Her. Kerk*, vol. iv.

NY'KÖPING, a sea-port of Sweden, pleasantly situated on the Baltic, in lat. 58° 45′ n., long. 17° e., about 60 m. s.w. of Stockholm. It comprises among its manufacturing products cotton goods, stockings, tobacco, etc., and has good ship-yards, mills, and manufactories for machinery, while in the vicinity of the town are extensive paper-mills. The ruined old castle of Nyköping, nearly destroyed by fire in 1665, and which ranked in point of strength next to those of Stockholm and Calmar, has experienced many eventful vicissitudes of fortune. King Valdemar of Sweden, after his dethronement in 1288, was imprisoned here till his death in 1302; but the most tragic incident connected with Nyköping castle was the horrible death within its walls of the dukes Eric and Valdemar, who, after being entrapped by their pusillanimous brother, king Birger, in 1317, were left to perish of hunger in a dungeon, the keys of which the king threw into the sea before he left the castle. The horror of this deed roused the indignation of the people, who seized upon the castle, sacked it, and demolished its keep and donjons. In 1719 the town was taken and dismantled by the Russians; and since then it has ceased to be the scene of any events of historical interest. It is noted for the pure Swedish spoken by its inhabitants. Pop. '76, 4,591.

NYL-GHAU, *Antilope picta*, or *Portax tragocamelus*, a species of antelope, with somewhat ox-like head and body, but with long slender limbs, and of great activity and fleetness. It is one of the largest of antelopes, and is more than four feet high at the shoulder. The horns of the male are about as long as the ears, smooth, black, pointed, slightly curved forwards. The female has no horns. The neck is deep and compressed, not rounded as in most of the antelopes. A slight mane runs along the neck and part of the back, and the breast is adorned with a long hanging tuft of hair. The back is almost elevated into a hump between the shoulders. The Nyl-ghau inhabits the dense forests of India and Persia, where it has long been regarded as one of the noblest kinds of game. It is often taken, like other large animals, by the inclosing of a large space with nets, and by great numbers of people. It is a spirited animal and dangerous to a rash assailant. It is capable of domestication, but is said to manifest an irritable and capricious temper.

NYMPHÆA'CEÆ, a natural order of exogenous plants, growing in lakes, ponds, ditches, and slow rivers, where their fleshy root-stocks are prostrate in the mud at the bottom; and their large, long-stalked, heart-shaped, or peltate leaves float on the surface of the water. Their flowers also either float, or are raised on their stalks a little above the water. The flowers are large, and often very beautiful and fragrant. There are usually four sepals, and numerous petals and stamens, often passing gradually into one another. The ovary is many-celled, with radiating stigmas, and very numerous ovules, and is more or less surrounded by a large fleshy disk. The seeds have a farinaceous albumen. More than fifty species are known, mostly natives of warm and temperate regions. The root-stocks of some of them are used as food, and the seeds of many.—See WATER-LILY, LOTUS, VICTORIA, and EURYALE.—Very nearly allied to Nymphæaceæ are *Nelumbiaceæ*. See NELUMBO.

NYMPHS, in classic mythology, female divinities of inferior rank, inhabiting the sea, streams, groves, meadows and pastures, grottoes, fountains, hills, glens, trees, etc. Among the nymphs, different classes were distinguished, particularly the *Oceanides*, daughters of Oceanus (nymphs of the great ocean which flows around the earth), the *Nereids*, daughters of Nereus (nymphs of the inner depths of the sea, or of the inner sea—the Mediterranean), *Potameides* (river nymphs), *Naiads* (nymphs of fountains, lakes, brooks, wells), *Oreades* (mountain nymphs), *Dryads* or *Hamadryads* (forest nymphs, who were believed to die with the trees in which they dwelt). They were the goddesses of fertilizing moisture, and were represented as taking an interest in the nourishment and growth of infants, and as being addicted to the chase (companions of the divine huntress Diana), to female occupations, and to dancing. They are among the most beautiful conceptions of the plastic and reverent (if credulous) fancy of the ancient Greeks, who, in the various phenomena of nature—the rush of sea-waves, the bubble of brooks, the play of sunbeams, the rustle of leaves, and the silence of caves—felt, with a poetic vividness that our modern science will hardly permit us to realize, the presence of unseen joyous powers.

NYS'SA. See TUPELO.

NYS'TADT, a t. of Finland, on the eastern coast of the gulf of Bothnia, 50 m. s. of Bjorneborg. Here, in 1721, a treaty was agreed to, between Russia and Sweden, by virtue of which all the conquests of Peter the great along the coasts of the gulf of Finland were annexed to Russia. Pop. '75, 3,708.

O

O, THE fifteenth letter in the English and in most western alphabets, is one of the five simple vowel signs of the English language. As the language is at present pronounced, it stands for at least four distinct sounds, heard in the words *note*, *nŏr*, (nŏt), *more*, *son*. The primary and simple sound of O is that heard long in *nŏr*, and short in *nŏt*, *tŏp*. The sound given to it in such words as *note*, *go*, is really a diphthong—a long *o* terminating in a slight *u* or *oo* sound$\left(\mathrm{o}\smile^{\mathrm{u}}\right)$. The corresponding letter in the Hebrew and Phenician alphabet (q.v.) was called Ayn, i.e., "eye;" and accordingly the primitive form of the Phenician letter was a rough picture of an eye, which naturally became a circle with a dot in the center—still to be seen in some ancient inscriptions—and then a simple circle.

O', a prefix in many Irish family names, serves to form a patronymic, like *Mac* in Gaelic names; as O'Brien, a descendant of Brien. By some, it is considered to be derived from *of;* but it is more likely from Ir. *ua*, Gael. *ogha*, a grandson. In the Lowland Scottish the word *oe* is used for grandson, and in some localities for nephew.

OA'HU, one of the Sandwich islands (q.v.).

OAJA'CO, or OAXACA, a Mexican state, bounded s. by the Pacific, e. by Tehuantepec and the gulf of Tehuantepec, w. and n. by Puebla and Vera Cruz; 31,882 sq.m.; pop. not far from 500,000; La Verda is the only river of consequence. The surface is almost entirely made up of mountains and table-lands and the climate is remarkably fine; the rainfall is large, and the heat less oppressive than in most other states of Mexico. The products of the soil are greatly varied; cochineal and indigo are the chief exports, and wheat, coffee, sugar, tobacco, cotton, cocoa, honey, plantains, and fruit of all kinds, are found. Gold and silver mines exist, but are of little importance. The soil is so rich that two crops of wheat and maize are produced annually. The inhabitants are mostly Indians, half-breeds, and mestizoes. The capital, Oaxaca, is beautifully situated in the center of the state.

OAJA'CO, OAXACA, or GUAXACA, a city of Mexico, capital of a state of the same name, stands on the river Rio Verde, 210 m. s.s.e. of Mexico. It covers an area 2 m. in length by 1¼ in breadth, is well built, with open streets, interspersed with plantations, on which the cochineal insect feeds, and has about 25,000 inhabitants. Silk, cotton, sugar, and chocolate are manufactured.

OAK. *Quercus*, a genus of trees and shrubs of the natural order *cupuliferæ*, having a three-celled ovary, and a round (not angular) nut—which is called an *acorn*—placed in a scaly truncated cup, the lower part of it invested by the cup. The species are very numerous, natives of temperate and tropical countries. A few species are found in Europe. North America produces many; and many are natives of mountainous regions in the torrid zone; some are found at low elevations in the valleys of the Himalaya, some even at the level of the sea in the Malay peninsula and Indian islands. But in the peninsula of India and in Ceylon none are found; and none in tropical Africa, in Australia, or in South America. The oaks have alternate simple leaves, which are entire in some, but in the greater number variously lobed and sinuated or cut; evergreen in some, but more generally deciduous. Many of them are trees of great size, famous for the strength and durability of their timber, as well as for the majesty of their appearance, and their great longevity. Throughout all parts of Europe, except the extreme n., two species are found, or varieties of one species, the Common Oak (*Q. robur*); one (*Q. pedunculata*) having the acorns on longish stalks, the other (*Q. sessiliflora*) having them almost without stalks. Other differences have been pointed out, but they are regarded by some of the most eminent and careful botanists as merely accidental, and not coincident with these; while, as to the length of the fruit-stalks, every intermediate gradation occurs. Both varieties occur in Britain, the first being the most prevalent, as it is generally in the n. of Europe; the second being more abundant in more southern countries. The short-stalked oak is sometimes called Durmast Oak in England. It has been much disputed which is entitled to be considered the true British oak; and much alarm has occasionally been expressed lest new plantations should be made of the wrong kind; whilst the most contradictory statements have been made as to the comparative value and characters of the timber. The oak succeeds best in loamy soils, and especially in those that are somewhat calcareous. It cannot endure stagnant water. It succeeds well on soils too poor for ash or elm; but depends much on the depth of the soil, its roots penetrating more deeply than those of most other trees. Noble specimens of oak trees, and some of them historically celebrated, exist in almost all parts of Britain; but are much more frequent in England than in Scotland. The former existence of great oak forests is attested by the huge trunks often found in bogs. The oak attains a height of from 50 to 100 or even 150 or 180 ft.; the trunk being 4, 6, or even 8 ft. in diameter. It sometimes grows tall and stately, but often rather exhibits great thickness of bole and magnitude of branches. It reaches its greatest magnitude in periods varying from 120 to 400 years, but lives to the age of 600, or even 1000. The timber is very solid, durable, peculiarly unsusceptible of the influence of moisture, and, therefore, eminently adapted for ship-building. It is also employed in carpentry, mill-work, etc.—The bark abounds in tannin; it also contains a peculiar bitter principle called *quercine*, and is used in medicine, chiefly in gargles, etc., on account of its astringency, sometimes also as a tonic; it is used along with gall-nuts in the manufacture of ink; but most of all for tanning (see Bark), and on this account the oak is often planted as copse-wood (see Copse) in situations where it cannot be expected to attain to great size as a tree. The timber of copse oak is excellent fire-wood. The oak is particularly fitted for copse-wood, by the readiness with which it springs again from the stools after it has been cut. Acorns are very nourishing food for swine, and in times of scarcity have been often used for human food, as, indeed, they commonly are in some very poor countries, either alone or mixed with meal. The bitterness which makes them disagreeable is said to be in part removed by burying them for a time in the earth. The acorns of some trees are also much less bitter than others, and oaks of the common species occur which produce acorns as sweet as chestnuts. Other varieties of the common oak are assiduously propagated by nurserymen as curious and ornamental, particularly one with pendulous branchlets (the *weeping oak*), and one with branches growing up close to the stem, as in some kinds of poplar. Among the Greeks and Romans the oak was sacred to Zeus or Jupiter; and it has been connected with the religious observances of many nations, as of the ancient Celts and Germans.—The Turkey Oak or Adriatic Oak (*Q. cerris*), now very frequently planted in Britain, is a large and valuable tree, very common in the s.e. of Europe, and in some parts of Asia. The timber is imported in considerable quantity into Britain for ship-building and other purposes. The leaves differ from those of the common oak in their acute lobes, and the cups of the acorns are *mossy*, i.e., have long, loose, acute scales. Similar to this, in both these respects, are the Austrian Oak (*Q. Austriaca*), abundant near Vienna, and the Spanish Oak (*Q. Hispanica*).—The Cork Oak or Cork-Tree (*Q. suber*) is noticed in the article Cork; the Holm Oak or Evergreen Oak (*Q. ilex*), another of the species found in the s. of Europe, in the article Ilex. Of the North American oaks, some are very valuable as timber trees. Perhaps the most important is the White Oak or Quebec Oak (*Q. alba*), a large tree, the leaves of which have a few rounded lobes. It is found from the gulf of Mexico to Canada; and in some places forms the chief part of the forest. The timber is less compact than that of the British oak; that of young trees is very elastic.—The Overcup Oak (*Q. lyrata*), a majestic tree, highly esteemed for its timber, and having its acorns almost covered by their globular cup, grows chiefly in lands liable to inundation in the southern states.—The Chestnut-leaved White Oak (*Q. prinus*) is also a much-esteemed timber tree of the southern states.—The Swamp White Oak (*Q. bicolor*), a closely allied species, extends further north.—The Live Oak (*Q. virens*), an evergreen species, with entire leathery leaves, is regarded as a tree of the first importance in the United States, from the excellence of its timber and its value for ship-building, so that efforts have been made by the government to protect it and to promote the planting of its acorns. Yet it is not a very large tree, being seldom more than 45 ft. in height, with a trunk of 2 ft. in diameter. It grows on the coasts of the gulf of Mexico, and as far north as Virginia. It once abounded on the Sea islands, now so celebrated for their cotton.—The **Red Oak** (*Q. rubra*), a large tree with sinuated and lobed leaves, the lobes toothed and bristle-pointed, yields great part of the *red oak staves* exported from Canada and the n. of the United States to the West Indies; but *red oak staves* are also produced in the middle and southern states by the **Scarlet Oak** (*Q. coccinea*), a very similar species, by the **Black Oak** or **Quercitron Oak** (*Q. tinctoria*), another species with the lobes of the leaves bristle-pointed, better-known for the dye-stuff which its bark yields (see **Quercitron**), and by the willow oak (*Q. phellos*), a large tree with lanceolate leaves and a willow-like aspect. The timber of all these species is of very inferior quality. These are the American oaks of greatest economical and commercial importance, but there are numerous other species, some of them trees, some mere shrubs, of which some grow on poor soils, and cover them in compact masses; resembling in this a single European species (*Q. viminalis*), a native of the Vosges, 6 to 8 ft. high, with slender, tough branches, which makes excellent hedges.—The **Black Jack** (*Q. nigra*) is an American oak, chiefly notable for the abundance in which it grows on some of the poorest soils. It is a small tree, and its timber of little value. The bark is black.—Some of the Nepaulese oaks are large and valuable trees, as are some of those of China and Japan, of Java, of Mexico, etc. The oaks of Java and the other Indian islands have generally the leaves quite entire.—The bark of most of the species of oak is capable of being used for tanning, and is used in different countries. The cups and acorns of the **Valonia Oak** (*Q. ægilops*) are exported from the Morea and other parts of the Levant in great quantities for this purpose, under the name of *valonia*. See **Leather**. The tree resembles the Turkey oak, and has very large hemispherical mossy cups. The cups are said to contain more tannin than any other vegetable substance.—Galls (q.v) or gall-nuts are in great part obtained from the oak, therefore called the **Gall-oak** (*Q. infectoria*), a scrubby bush, a native of Asia Minor, with bluntly serrated, ovate-oblong leaves.—The **Kermes Oak** (*Q. coccifera*), on the leaves of which the kermes (q.v.) insect is found, is a low bush, with evergreen spinous leaves, much resembling a holly, a native of the s.e. of Europe.—Of oaks with sweet and edible acorns, may be mentioned the **Ballote Oak** (*Q. ballota* or *gramuntia*), an evergreen with round spiny-toothed leaves, a native of the n. of Africa, the acorns of which are regularly brought to market in Algeria and in Spain, and are long and cylindrical; the Italian oak (*Q. æsculus*), closely allied to the common oak; and the **Dwarf Chestnut Oak** (*Q. chinquapin* or *prinoides*) of North America, a small shrubby species, which has been specially recommended to cultivation on this account. Other North American species, and some of the Himalayan species, also produce edible acorns. From the acorns of some species, oil is made in considerable quantity in different parts of the world, and is used in cookery.—The leaves of the manna oak (*Q. mannifera*)—a native of the mountains of Kurdistan, having oblong, blunt-lobed leaves—secrete in hot weather a kind of manna, a sweet mucilaginous substance, which is made into sweetmeats, and very highly esteemed.

The name oak is sometimes popularly applied to timber trees of very different genera. Thus, **African Oak** is another name of African teak. See **Teak**. Some of the species of *casuarina* (q.v.) are called oak in Australia. The **Stone Oak** (*lithocarpus Javenensis*) of Java, so named from the extreme hardness of its timber, is a tree of the same family with the true oaks.

OAK APPLE. See **Gall-Fly**; **Galls**; *ante*.

OAK BEAUTY, *Biston prodromaria*, a moth of the family *geometridæ*, a native of England, about an inch and a half or two inches in expanse of wings; the upper wings with two brown curved bands, and margined with black, the lower wings with one brown band. The caterpillar feeds on the oak.

OAKES, Urian, d.d., 1631–81; b. England. He emigrated to Massachusetts in 1634, graduated at Harvard in 1649, and published at Cambridge a set of astronomical calculations while quite young. He accepted a pastorate at Fitchfield, Eng., which his nonconformist views compelled him to relinquish in 1662, and later he preached to another congregation. On account of his learning and piety, he was chosen pastor of the church in Cambridge, whither he returned, commencing his labors in 1671. He accepted the presidency of Harvard college in 1675, being formally installed five years later; and held this position until his death.

OAK'HAM, the county-town of Rutlandshire, Eng., in the vale of Catmos, 25 m. w.n.w. of Peterborough. It is a station on the Syston and Peterborough branch of the Midland railway. In former times, there was a castle here; it is now in ruins with the exception of the portion used as the county-hall. The church, the interior of which was beautifully restored in 1858, is an edifice in the perpendicular style, and has a fine tower and spire. The free grammar school, with an endowment of about £700 a year, was founded in 1581. Pop. (1871) 2,911.

OAKLAND, a co. in s.e. Michigan, drained by the Clinton, and branches of the Huron and Flint rivers; crossed by the Detroit and Milwaukee, and the Flint and Perè

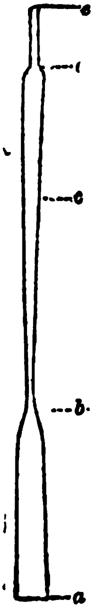
Marquette railroads; 900 sq.m.; pop. '70, 40,876. The surface in the northern portion is undulating, and numerous small lakes diversify it; in most parts the soil is fertile, and in good cultivation; about a quarter of the county is still covered with forests. Wheat, Indian corn, oats, live stock, and butter, are the chief productions; it contains flour mills, carriage, saddlery, plaster and casting manufactories. Co. seat, Pontiac.

OAKLAND, the seat of justice of Alameda co., Cal., on the e. shore of San Francisco bay, terminus of the Central Pacific railroad, 7 m. e. of San Francisco; pop. '75, 23,000. The city takes its name from a grove of majestic evergreen oaks, in which it was first built; but beyond which it now extends. It is a favorite residence for the merchants of San Francisco, and has many drives, fine scenery and a healthy climate. It is governed by a mayor and city council, has a paid fire and police department; is supplied with water from a stream five m. distant, and with gas. San Antonio creek, on the s. front, forms a harbor for the city, but a bar at its mouth obstructs the passage of large vessels at low tide. A pier runs along the w. water front, which is shallow, a distance of 2 m. into the bay; on it are warehouses, three docks, a carriage way, and the rails of the Central Pacific railroad, which connects with the ferry for San Francisco. The city has street railroads, two libraries, graded schools, academies, and educational, benevolent, and horticultural societies; numerous incorporated companies with large capital; manufactories of wind mills and carriages, planing, quartz, and flour mills; cordage and jute factories, the last producing 5,000,000 sacks annually; marble, iron, smelting and metallurgical works; and daily, weekly, and monthly periodicals. It was incorporated as a city in 1854.

OAK'UM, a tangled mass of tarred hempen fibers, is made from old rope by untwisting the strands and rubbing the fibers free from each other. Its principal use is in caulking (q.v.) the seams between planks, the space round rivets, bolts, etc., for the purpose of preventing water from penetrating.

OANNES, the name of a Babylonian god, who, in the first year of the foundation of Babylon, is said to have come out of the Persian gulf, or the old Erythræan sea, adjoining Babylon. He is described as having the head and body of a fish, to which were added a human head and feet under the fish's head and at the tail. He lived amongst men during the day-time, without, however, taking any food, and retired at sunset to the sea, from which he had emerged. Oannes had a human voice, and instructed men in the use of letters, and in all the principal arts and sciences of civilization, which he communicated to them. Such is the account of him preserved by Berosus and Apollodorus. Five such monsters are said to have come out of the Persian gulf; one, called Anedotos or Idotion, in the reign of Amenon, the fourth king of Babylon; another in that of the fifth king; and the last, called Odacon (or Ho Dagon), apparently the Phenician Dagon, under the sixth. Many figures of Oannes, resembling that of a Triton, having the upper part of a man, and the lower part of a fish, or as a man covered with a fish's body, have been found in the sculptures of Kouyonjik and Khorsabad, as well as on many cylinders and gems. Oannes is supposed to have symbolized the conquest of Babylonia by a more civilized nation coming in ships to the mouth of the Euphrates; but he is apparently a water-god, resembling in type and character the Phenician Dagon, and the Greek Proteus and Triton.

Helladius, *Apud Phot. Cod.* 279, pp. 535, 34; Richter, *De Beroso;* Cory. *Anc. Fragm.* p. 30; 1 Sam. v. 4; Bunsen, *Egypt's Place*, vol. 1. p. 705; Layard, *Nineveh*, p. 343.



OAR.

OAR, a wooden instrument by which a person sitting in a boat propels it through the water. The form found in practice to combine greatest power with lightness, is that shown in the figure. From *a* to *b* is the blade of the oar, thin and nearly flat, though occasionally somewhat curved, so as to present a concave surface to the water; from *b* to *d* is round or square, gradually thickening towards *d*, that the part *ce* may nearly balance the part *ac*. At *de* is the handle, which is grasped by one or both hands. The oar rests at *c* on the *row-lock*, and in many cases some device is resorted to to retain the oar from slipping outwards. In the Thames, a leathern stop, called a button, is used; sometimes a pin in the gunwale of the boat passes through the oar (but this weakens the oar, and precludes *feathering*); at other times the oar is fastened to the pin by a leathern thong. The action of an oar in moving a boat is that of a lever, the rower's hand being the power, the water the fulcrum, against which the oar presses, and the row-lock the point at which the opposition caused by the weight of the boat and its cargo is felt. *Feathering* an oar consists in turning it, immediately on leaving the water, so that the flat blade of the oar is horizontal, and in preserving this position until just before the fresh dip, when of course the vertical position must be resumed. Feathering diminishes the resistance offered by air, wind, and small waves; it also adds greatly to the beauty and grace of rowing.

The best oars are of Norway fir, though some are made of ash and beech.

O'ASES, certain cultivated spots in the Libyan desert (called also *Auasis*, *Ouasis*, or *Hoasis*) which produce vegetation, owing to the presence of springs issuing from the ground. The principal oases are those lying to the w. of Egypt, a few days' journey from the Nile, and known to the ancients by the name of the greater and lesser oases, and that of Ammon. It is supposed that they were known to the Egyptians during the 12th dynasty under the name of *Suten-Khenn*, but no evidence of their occupation by the Egyptians earlier than Darius has been found *in situ*. By some of the ancients they were called the islands of the blessed, or compared to the spots on a panther's skin. Their name is supposed to be the Coptic *Ouahé* (inhabited place). They are first mentioned by Herodotus in his account of the destruction of the army of Cambyses by the storm of sand, or simoom. Equally celebrated is the visit of Alexander the great to the oasis, which he successfully accomplished after the conquest of Egypt, and passed through the desert a nine days' journey before he reached the temple of Ammon, the priests of which declared him the son of that god, and the future conqueror of the entire world. Herodotus describes that of El Wah, or the oasis Magna of the Romans, which contained the oracle of Ammon, and which lies seven days' journey w. of Thebes. It appears to have been anciently frequented by caravans going to the pillars of Hercules. Strabo mentions three oases: the first seven days' journey w. of Abydos; the second, w of the lake Mœris; the third, near the oracle of Ammon. Pliny mentions two oases; so does Ptolemy, who calls them the lesser and greater. Under the Roman empire, they were used for temporary banishment of criminals of state, and the poet Juvenal was sent there. Olympiodorus, a native of the Thebiad, gives a glowing description of them in the days of Theodosius the younger. Under the Byzantine emperors, the emperors banished there the heads of the Catholic party, at the instigation of the Arians, in the 4th c., and Athanasius himself is supposed to have taken refuge in them. In the 5th c., Nestorius the bishop of Constantinople, was banished there. He was rescued by an excursion of the Blemyes, but expired soon after his arrival at the Nile. The oases were then a place of desolation and horror, occasionally plundered by Bedouins. They fell, 943 A.D., into the power of the Arabs, after having been held by the Egyptian monarchs and their successors till that period; and they are described by Edrisi (1150 A.D.) as uninhabited; by Abulfeda (1240 A.D.) and by Leo Africanus (1513 A.D.), as inhabited and cultivated, and quite independent, having three fortresses. The first modern traveler who visited them is supposed to have been Poncet (1698 A.D.). Subsequently, in 1792, Browne discovered the oasis of Ammon at El Siwah; and it was visited in 1798 by Hornemann, and in 1819 by Cailliaud. It lies in 29° 12′ 20″ n. lat., and 26° 6′ 9″ e. long. Drovetti and Minutoli also visited the same spot.

These oases are now held by Muggrebi Arabs, a powerful race in the desert, capable of raising 30,000 men, who supply camels and guides to travelers. The principal oases are: 1. El Khargeh, or the Oasis Magna, the Greater Oasis of Ptolemy; 2. El Kasr, or Oasis Parva, the Lesser Oasis; 3. Siwah, or the Oasis of Ammon, the most northerly; 4. The Western Oasis, or Dakkel, mentioned by Olympiodorus, and visited by sir Archibald Edmonstone in 1819, and Rohlfs in 1874. Of El Khargeh full particulars have been given by M. Hoskins, who discovered it lying about 125 m. w. of the Nile, having a stream of water rising near the village of Genah, on the north-west of the oasis, and lost in the sand. It is bounded on the e. by Hagel-bel-Badah. North of El Gem lies the metropolis, El Khargeh, which consists of a series of covered streets and open bazaars. The temple lies two hours' journey from it, in a fine situation; the *sekos* has a vestibule of 500 f., with pylons, or gateways, the first of which has a decree in Greek, dated in the reign of Galba (68 A.D.), against forcing persons to farm the revenue, preventing imprisonment for debt, preserving the dowries of women, and limiting the office of strategos for three years. The temple has other decrees preventing the officers of government from smuggling. It has an avenue of sphinxes and three pylons; on the third, Darius is represented offering to Amen Ra, Osiris, and Isis; while Nekht-her-hebi (Nectabes) continued the ornaments of the temple about 414–340 B.C. The sekos is 140 ft. long, and represents Darius offering to Amen Ra, or Khnumis, the ram-head god, and Osiris; while in the accompanying scenes are seen Anta, or Anaitis, Raspu, or Reseph. In the vicinity is a magnificent necropolis of 150 sepulchers, of a late period, with Doric and Corinthian capitals. There are several temples at other spots of the oases. 2. El Kasr, the Oasis Parva, lies four or five days' journey s.e. of Siwah, called the Wah-el-Bahnasa, or Wah-el-Menesheh, contains no monuments older than the Roman, consisting of a triumphal arch, subterraneous and other aqueducts, several hot springs, a necropolis, and Christian church. This oasis was first conquered by the Arabs; and in its vicinity is another oasis called Wady Zerzoora, with others adjoining, of inferior interest. 3. Siwah, or the Oasis of Ammon—one of the first discovered, and repeatedly visited, has, unfortunately, not been seen by any one acquainted with hieroglyphics—lies w. of the Natron lakes. It would appear from Minutoli that the temple was built by Nekht-her-hebi, or Nectabes I., in honor of the god Khnum, Ammon Khnumis or Chnebis, who as the deity of water, presided over the water from which the oasis originated. The oasis is 9 m. long and 2 broad, contains El Garah Gharmy, and Menchyeh, has a population of about 8,000 inhabitants, possesses date and other trees, grows cereals, and has sulphurous springs, a salt lake at Arachieh, and many ruined temples, a necropolis, and other remains. The oracle of Ammon is supposed to have been at a place called Om-Beydah, or the temple of Nekht-her-hebi. From this, it would seem that the oasis did not fall into the power of Egypt till about the 5th c. B.C. The celebrated Fountain of the Sun is at Siwah Shargieh. It is 30 paces long, 20 broad, six fathoms deep, with bubbles constantly rising to the surface, steaming in the morning, and warmer at night. Close to it are the remains of the sanctuary of Ammon. 4. El Dakkel, or the Western Oasis, lies about 78 m. s.w. of Siout. The principal ruin at Dar-el-Hadjar consists of a small temple, dedicated to Khnumis by the Roman emperors Nero and Titus. At Ain Amoor, between this oasis and the Oasis Magna, is a temple built under the Roman empire.—Herodotus, iii. 26; Strabo, ii. p. 130, xvii. pp. 790, 791, 813, Ptolemy, iv. 5, 37; Minutoli, *Reise zum Tempel des Jupiter Ammon* (Berlin, 1824); Hoskins, *Visit to the Great Oasis* (8vo. Lond. 1837); Champollion, *L'Egypte*, p. 282.

OAT, or **OATS**, *Avēna*, a genus of grasses, containing many species, among which are some valuable for the grain which they produce, and some useful for hay. The Linnæan genus *avena*, less natural than most of the Linnæan genera, has been much broken up. The genus, as now restricted, has the spikelets in loose panicles, the glumes as long as the florets, and containing two or more florets; the paleæ firm, and almost cartilaginous, the outer palea of each floret, or of one or more of the florets, bearing on the back a knee-jointed awn, which is twisted at the base. The awn, however, tends to disappear, and often wholly disappears in cultivation. Those species which are cultivated as corn-plants have comparatively large spikelets and seeds, the spikelets—at least after flowering—pendulous. The native country of the cultivated oats is unknown, although most probably it is central Asia. There is no reference, however, to the oat in the Old Testament; and although it was known to the Greeks, who called it *bromos*, and to the Romans, it is probable that they derived their knowledge of it from the Celts, Germans, and other northern nations. It is a grain better suited to moist than to dry, and to cold than to warm climates, although it does not extend so far north as the coarse kinds of barley. The grain is either used in the form of groats (q.v.) or made into meal. Oatmeal cakes and porridge form great part of the food of the peasantry of Scotland and of some other countries. No grain is so much esteemed for feeding horses. Besides a large quantity of starch—about 65 per cent—and some sugar, gum, and oil, the grain of oats contains almost 20 per cent of nitrogenous principles, or proteïne (q.v.) compounds, of which about 16 or 17 parts are *avenine*, a substance very similar to *caseïne* (q.v.), and two or three parts gluten, the remainder albumen. The husk of oats is also nutritious, and is mixed with other food for horses, oxen, and sheep. From the starchy particles adhering to the husk or *seeds* after the separation of the grain, a light dish, called *sowans* is made in Scotland by means of boiling water, was once very popular, and is very suitable for weak stomachs. The grain is sometimes mixed with barley for distillation. The Russian beverage called *quass* is made from oats. The straw of oats is very useful as fodder, bringing a higher price than any other kind of straw.—The varieties of oats in cultivation are very numerous, and some highly esteemed varieties are of recent and well-known origin. It is doubtful if they really belong to more than one species; but the following are very generally distinguished as species: 1. COMMON OAT (*A. sativa*), having a very loose panicle, which spreads on all sides, and two or three fertile florets in each spikelet, the paleæ quite smooth, not more than one floret awned; 2. TARTARIAN OAT (*A. orientalis*), also called HUNGARIAN OAT and SIBERIAN OAT, distinguished chiefly by having the panicle much more contracted, and all turned to one side; 3. NAKED OAT (*A. nuda*), differing from the Tartarian oat chiefly in having the paleæ very slightly adherent to the seeds, which, therefore, fall readily out of them, whilst in the other kinds they adhere closely; 4. CHINESE OAT (*A. chinensis*), which agrees with the last in the characters of the paleæ and seeds, but is more like the common oat in its panicle, and has more numerous florets, 4–8, in the spikelet; 5. SHORT OAT (*A. brevis*), which has a close panicle turned to one side, the spikelets containing only one or two florets, each floret awned, the grains short. Almost all the varieties of oat in cultivation belong to the first and second of these species. The naked oat is cultivated in Austria, but is not much esteemed. The Chinese oat, said to have been brought by the Russians from the north of China, is prolific, but the grain is easily shaken out by winds. The short oat is cultivated as a grain-crop on poor soils at high elevations in the mountainous parts of France and Spain, ripening where other kinds do not; it is also cultivated in some parts of Europe as a forage plant. Besides these, there is another kind of oat, the BRISTLE-POINTED OAT (*A. strigosa*), regarded by some botanists as belonging even to a distinct genus, *danthonia*, because the lower palea is much prolonged, and instead of merely being bifid at the point, as in the other oats, is divided into two long teeth, extending into bristles. The panicle is inclined to one side, very little branched; the florets, 2 or 3 in a spikelet, all awned, the grain rather small. This plant is common in corn-fields, is cultivated in many countries, but chiefly on poor soils, and was at one time much cultivated in Scotland, but is now scarcely to be seen as a crop. Not unlike this, but with the panicle spreading equally on all sides, the outer palea merely bifid, and long hairs at the base of the glumes, is the WILD OAT (*A. fatua*), also frequent in corn-fields, and a variety of which is cultivated in some northern countries for meal, but which is more generally regarded by farmers as a weed to be extirpated, springing up so abundantly in some districts as to choke crops of better grain. Its awns have much of the hygrometrical property which gains for *A. sterilis*, a species found in the south of Europe, the name of the ANIMAL OAT, because the seeds when ripe and fallen on the ground resemble insects, and move about in an extraordinary manner through the twisting and untwisting of the awns. The seed of the WILD OAT has been sometimes used instead of an artificial fly for catching trout. Amongst the species of oat useful not for their grain but for fodder are the DOWNY OAT-GRASS (*A. pubescens*) and YELLOW OAT-GRASS (*A. flavescens*), both referred by some botanists to the genus *trisetum*—the short awn being like a middle tooth in the bifid palea—and both natives of Britain, the former growing on light ground and dry hills, especially where the soil is calcareous, the latter on light meadow lands. Other species are found in Britain, continental Europe, North America, Australia, etc. In some parts of the Sahara are bottoms of ravines richly productive of a species of oat-grass (*A. Forskalii*) much relished by camels.

Far more ground is occupied with oats in Scotland than with any other grain. In all the higher districts, it is almost the only kind of grain which is cultivated. Throughout Scotland it is the crop that is chiefly sown after land has been in pasture for one or more years. The seed is generally sown broadcast over the plowed land, which is afterwards well harrowed and pulverized. It is of the utmost importance to have the latter operations well done, as it prevents the attacks of insect larvæ. On soils that are infested with annual weeds, such as charlock, it is common to drill the seed, which permits the land to be hand-hoed and thoroughly cleaned. Oats thrive best upon deep and rich soils, and yield but poorly on thin sandy soils, where they suffer sooner from drought than barley, rye, or wheat. On good soils, it is common to dress oats with 2 to 3 cwts. of guano to the acre. The plant is not easily injured by large applications of heterogeneous manures. The potato oat is a variety generally cultivated in the best soils and climates. It is an early and productive variety. The Hopetoun oat is also much sown in the earliest districts. The sandy oat is still more largely sown, more particularly when the climate is inferior and wet. It is not liable to be lodged with rains, and the straw is of fine quality for fodder. All these are varieties of the common oat. The white and black Tartarian are much cultivated in some districts. They are very productive. On the continent of Europe this grain is seldom seen of quality equal to what is produced in Scotland; and even in most parts of England the climate is less suitable to it, and it is less plump and rich.

OATES, (*alias* AMBROSE,) TITUS, was the son of a ribbon weaver, who, having first become an Anabaptist minister under Cromwell, took orders and a benefice in the English church after the restoration. Titus appears to have been born about 1620 in London. He was a pupil of Merchant Taylor's school, whence he passed to Trinity college, Cambridge, took orders, and received a small living from the duke of Norfolk. This position, however, he forfeited, in consequence of a malicious prosecution, in which he narrowly escaped conviction for perjury; and having been afterwards appointed to the chaplaincy of one of the king's ships, he was expelled form it on a charge still more disgraceful. In this extremity he conformed to the Roman Catholic church, and was admitted as a scholar of the Jesuits' college at Valladolid; but was expelled for misconduct, after a trial of a few months. He was again received by the Jesuits, on his earnest protestations of repentance, at St. Omer, where he was no less unsuccessful, and was finally dismissed by them in the early part of 1678. He now, as a mere vagabond adventurer, set himself to live by his wits, in the evil exercise of which he devised, about this time, the atrocious scheme with which his name is identified in history. Just then great excitement and alarm pervaded the Protestant party in England. It was well known that Charles was at heart a Roman Catholic; and his brother, the duke of York, afterwards James II., was an active and avowed zealot on the same side. The growing confidence of the Roman Catholics was unconcealed; and with or without instant reason, the cry so often since heard arose, and was everywhere re-echoed that the "Protestant religion was in danger." In this fevered state of general feeling, Oates saw his opportunity, and dexterously and boldly availed himself of it. He communicated to the authorities the details of a pretended plot, the figment of his own brain, the main elements of which were a rising of the Catholic party, a general massacre of Protestants, the burning of the city of London, the assassination of the king, and the invasion of Ireland by a French army. In certain of its items the fiction was devised with considerable ingenuity to catch the proper belief. By the strangest coincidence, moreover, there just then occurred in aid of it a series of events which seemed conclusively to attest its genuineness. A correspondence, the object of which was the propagation of the Roman Catholic religion, came to light between the secretary of the duke of York and Pere La Chaise, the confessor and confidant of Louis XIV. Danby, the prime minister, it also appeared, had been busy with intrigues in the same quarter. Finally, Godfrey, the zealous magistrate through whom publicity was first given to "the plot," was found mysteriously murdered. After this, could reasonable doubt exist? Was not the English St. Bartholomew already begun. All London went wild with fear and rage; and it seemed at one time likely that a massacre of Roman Catholics would be substituted for the dreaded extermination of the Protestants. The parliament, which might have done something to allay the excitement, was itself swept headlong away by it. The king alone, whose life was threatened, but who, dissolute and indolent as he was, wanted neither courage nor shrewdness, much to his honor, scornfully insisted that the plot was merely some insane delusion, and tried, so far as he could, to control the excesses which followed. Too probably his interference was of the characteristically easy, *insouciant* kind; in any case, it did not avail. The story of Oates was universally believed and he became the popular hero of the day. A pension of £900 a year was granted him: a suite of apartments in the palace at Whitehall was set apart as sacred to his use; and wherever he went, the Protestant public wildly cheered him as their savior. With the aid of a set of suborned ruffians, only one degree less foul than himself, convictions of his victims were readily obtained, judges and juries vying with each other in their unquestioning reception in evidence of the grossest and most manifest perjuries; and many innocent Roman Catholic gentlemen died the death of traitors at the block. Over the space of two years, the base success of Oates was signalized by a series of judicial murders. Naturally, however, as reason resumed its sway, doubts began to be felt; and on the execution of a venerable and respected nobleman, viscount Stafford, with a strong shock of pity and remorse, public suspicion awoke, and a violent reaction set in. It was only, however, on the accession of James II., in 1685, that retribution overtook the malefactor. Active steps against him were then taken. He was tried before the court of king's bench, convicted of perjury, and sentenced to be pilloried, whipped at the cart's tail, and afterwards imprisoned for life. We might wonder a little at the leniency of the sentence, were it not thus to be explained: it was intended that the severity of the first two items of punishment should render the last one superfluous, and that the wretch should die under the lash of the executioner. But the hide of Oates was beyond calculation tough; and horribly lacerated, yet living, his carcass was conveyed to the prison, from which it was meant never more to issue. Very strangely, however, the next turn of the political wheel brought back the monster to the light of day and to prosperity. When the revolution of 1688 placed William on the throne, the Protestant influence triumphed once more. In the outburst of enthusiasm which ensued, what more natural than that Oates should be glorified as a Protestant martyr? Parliament solemnly declared his trial an illegal one: he was pardoned, and obtained his liberty; and in order to his perfect enjoyment of it, a pension of £300 a year was granted him. He was, however, no more heard of; he passed his 17 remaining years in obscurity, and died in in 1705 at the good old age of 86.

OATH (Ang.-Sax. *ath*, Ger. *eid*), in the religious use of the word, may be defined an expressed or implied calling upon the Almighty to witness the truth of an asseveration, or the good faith of a promise; with which is ordinarily conjoined an imprecation of his vengeance, or a renunciation of his favor, in case the asseveration should be false, or the promise should be broken. This practice has prevailed, in some form or other, in almost all the religions of the ancient, as well as of the modern world. It supposes, however, a belief of the existence of a provident Supreme Being, in order to its moral efficacy as a safeguard of truth. Among the Jews, we find instances in Gen. xiv. 22, xxi. 24, xlvii. 31, l. 5, confirmed even by the example of God himself, Numb. xiv. 28, Jer. xliv. 26, Isa. lxii. 8. It was strictly forbidden to the Jews to swear by false gods (Amos viii. 14, Jer. xii. 16). The form of oath was probably variable, either a direct adjuration as "The Lord liveth," or an imprecation, "The Lord do so to me;" but in all cases, the strongest denunciations are held out against the false swearer (Exod. xx. 7, Lev. xix. 12). Oaths were employed, both judicially and extrajudicially, by the ancient Egyptians, Assyrians, Medes, and Persians, as well as by the Greeks, and also by the Romans. The forms were very various—one of the most solemn consisting in the act of placing the hand on the altar of the deity who was invoked as witness. In the judicial proceedings of both the last-named nations, oaths were employed, but not universally; and in examples of their extrajudicial use, the literatures of both abound. In the Christian dispensation, the solemnity of an oath is enhanced by the elevated idea of the sanctity and perfection of the deity.

The lawfulness and fitness of the practice, under circumstances of due solemnity, are commonly recognized by Christians. Some communions, of which the most remarkable are the Moravians and the Society of Friends, applying literally the words of Christ (Matt v. 34), regard all oaths as unlawful. But other communions generally restrict this prohibition to ordinary and private discourse, and find in Rom. i. 9, 2 Cor. xi. 21, Gal. i. 20, Phil. i. 8, and 1 Thess. ii. 5, full warrant for the lawfulness of oaths in judicial and other solemn use. From some passages of the fathers, it might seem that they shared the difficulties of the Quakers and Moravians on the subject of the lawfulness of swearing; but these fathers for the most part referred to the oaths required of Christians by the pagans, which generally involved a recognition of particular pagan divinities; and they condemned these pagan oaths, rather as involving or even directly containing a profession of the popular paganism than as unlawful in themselves. The Christians of the later ages may perhaps be said to have multiplied in an opposite degree the occasions of oaths; especially of what were called "purgatorial" oaths, in which a party charged with a crime justified himself by swearing his innocence. These oaths were commonly accompanied by some imprecatory form or ceremonial, and were often expected to be followed by immediate manifestations of the divine vengeance upon the perjurer. The common instrument of attestation on oath was the Bible or some portion of it; but oaths were sometimes sworn on the relics of saints, or other sacred objects; sometimes simply by raising the hand to heaven, or by laying it upon the breast or the head. In canonical processes, the oath was often administered to the party kneeling. The forms varied very much; the most general being that which the English oath still retains (*Sic me Deus adjuvet*). Divines commonly require, in order to the lawfulness of an oath, three conditions (founded upon Jer. iv. 2), viz., *truth*, *justice*, and *judgment*—that is to say (1), that the asseveration, if the oath be assertive, shall be *true*, and that the promise, if the oath be promissory, shall be made and shall be kept *in good faith;* (2), that the thing promised shall be objectively lawful and good; (3), that the oath shall not be sworn without due discretion and deliberation, and without satisfactory reasons founded on necessity, or at least on grave and manifest utility.

The Mohammedans do not employ oaths in their judicial proceedings; but they regard deliberate perjury, even when extrajudicially committed, as sinful, and deserving of God's vengeance. For this, however, they require that the oath should be an express adjuration of God himself by some one of his well-known holy names; that the jurant should be of full age and intelligence; and that the oath should be sworn deliberately, and with the intention of swearing.

OATH, in point of law, is that kind of solemn declaration which is necessary as a condition to the filling of some office more or less public, or of giving evidence in a court of justice. Nearly all the great public offices of the state in this country can only be filled by persons who are willing to take an oath before acting in such office. The most important office of all—that of king or queen of Great Britain—requires a coronation oath (q.v.). Members of parliament also require to take the oath of fidelity and true allegiance, and promising to maintain the succession, in a full house, before taking their places (29 and 30 Vict. c. 19). Quakers and others may make an affirmation to the same effect. In 1868 and 1871 great changes were made as to oaths. The oath of allegiance and the official oath must now be taken by the great officers of state, such as the first lord of the treasury, chancellor of the exchequer, lord chancellor, secretaries of state, etc., in England. In Scotland the same are taken by the lord keeper of the great seal and privy seal, lord clerk register, lord advocate, and lord justice-clerk; so in Ireland by the lord lieutenant, lord chancellor, and two others. The oath of allegiance and the judicial oath are taken by the superior judges in each kingdom, justices of the peace, and Scotch sheriffs. No others, except under the clerical and parliamentary oaths acts, are to take the oaths of allegiance, supremacy, and abjuration, or any oath substituted for these. All others who used formerly to take oaths now make declarations of fidelity in their office, and in some cases also one of secrecy.

The most important oaths affecting the general public are those which are required to enforce the truth from witnesses in courts of justice. It may be stated that jurymen, where they are called upon to exercise their functions, are also required to take an oath. The oath is read to the juror thus—"You shall well and truly try the issue between the parties, and a true verdict give, according to the evidence, so help you God:" and the juror kisses the New Testament. Witnesses who are called to give evidence must all be first sworn in a similar manner, the words being, "The evidence you shall give shall be the truth, the whole truth, and nothing but the truth, so help you God." Hence the person who is a witness must have sufficient understanding to know the nature and obligations of an oath; and on this ground, young children are incompetent to be witnesses. Another condition or qualification required in the party who takes an oath as a witness is, that he has a competent sense of religion, in other words, he must not only have some religious knowledge, but some religious belief. He must, in substance, believe in the existence of a God, and in the moral government of the world; and though he cannot be questioned minutely as to his particular religious opinions, yet, if it appear that he does not believe in a God and future state, he will not be allowed to give his evidence, for it is assumed, that without the religious sanction, his testimony cannot be relied upon. So long, however, as a witness appears to possess competent religious belief, the mere form of the oath is not material. The usual practice in England and Ireland is, for the witness, after hearing the oath repeated by the officer of court, to kiss the four gospels by way of assent; and in Scotland, the witness repeats similar words after the judge, standing and holding up his right hand, "swearing by almighty God, as he shall answer to God at the great day of judgment," but without kissing any book. Jews are sworn on the Pentateuch, keeping on their hats, and their oath ends with the words, "so help you Jehovah." A Mohammedan is sworn on the Koran; a Chinese witness has been sworn by kneeling and breaking a china saucer against the witness-box. Thus the mere form of taking the oath is immaterial; the witness is allowed to take the oath in whatever form he considers most binding upon his own conscience—the essential thing being, however, that the witness acknowledge some binding effect derived from his belief in a God or a future state.

The policy of insisting upon the religious formalities attending the taking of an oath, has been much discussed of late years, and it has been disputed whether atheists, who avow an entire absence of all religious belief, should be entirely rejected as witnesses (as is sometimes the case), and justice be thereby frustrated. The objections of Quakers, Moravians, and Separatists to taking an oath have long been respected as not being fundamentally at variance with a due sense of religious feeling, and hence they have by statute been allowed to make an affirmation instead of taking the oath. In 1854 another concession was made to those who, not being Quakers, yet refuse to take the oath from sincere conscientious motives, and these are now also allowed to affirm instead of swear. But the law remains as before, that atheists and persons who admit that they have no religious belief whatever, are excluded from giving evidence in courts of justice.

When a witness, after being duly sworn, gives false evidence in a court of justice or in a judicial proceeding, and his evidence so falsely given is material, he commits the offense of *perjury;* but it is necessary, in England, not only that two witnesses shall be able to prove the falsity of such evidence, but also that the party should be proceeded against, in the first instance, before a justice of the peace, or by order of a judge, or the attorney-general, it being found that frivolous and unfounded indictments were often preferred against witnesses by disappointed or hostile parties. As a general rule, perjury cannot be committed except in some judicial proceeding, or rather the giving of false evidence cannot be punished except it has been given in some judicial proceeding. The practice formerly existed of persons voluntarily taking oaths in various matters not connected with any judicial proceeding; and creditors often in this manner sought to add to other securities by insisting on a formal oath before a justice of the peace, in some isolated matter of fact. This practice was put an end to by the statute 5 and 6 Will. IV. c. 62, by which justices of the peace were prohibited from administering or receiving such oaths touching any matter or thing whereof such justice has not jurisdiction or cognizance by some statute. It is left to some extent to the discretion of the justice whether the particular matter is one as to which it is proper to administer an oath; but when it is considered proper, the declaration may be made in the form given by that statute; and if the party make a false declaration, he commits a misdemeanor. Unlawful oaths generally mean oaths taken by members of secret and illegal societies of a treasonable description; and statutes long ago passed to inflict penalties on all who took or adminstered such oaths.

OATH OF CALUMNY, in Scotch law, means an oath taken by a party at the instance of his opponent, that the allegations were well founded. Oaths of verity and credulity are oaths that a debt or claim is well founded.

OATHS, Military. The taking of the oath of fidelity to government and obedience to superior officers, was, among ancient armies a very solemn affair. A whole corps took the oath together, sometimes an entire army. In modern times, when so many other checks are used for maintaining discipline, the oath has become little more than a form. In the United Kingdom a recruit enlisting into the army or militia, or a volunteer enrolling himself, swears to be faithful to the sovereign, and obedient to all or any of his superior officers; also to divulge any facts coming to his knowledge which might affect the safety of his sovereign, or the stability of that sovereign's government. The members of a court-martial take an oath to try the cases brought before them justly, according to the evidence, to keep secret the finding until confirmed by the crown, and to keep secret always the opinions given by the members individually. The only other military oath is the common oath of a witness before a court-martial to tell the truth, the whole truth, and nothing but the truth.

OAXA'CA. See Oajaco.

OB, or Obi, the great river of western Siberia, rises in two branches, the Bia and the Katune or Katunga, both of which have their origin in the Altai mountains, within the frontier of the Chinese dominions, about lat. 49° n., and long. 90° east. These branches flowing in a n.w. direction, unite to form the Ob at the town of Biisk in lat. 52° 30′ n., long. 85° east. Pursuing a winding course, with a general n.w. direction, the Ob reaches the meridian of 75° e., when it turns w., and maintains that direction to its confluence with the Irtish, the greatest of its tributaries. It then flows n.w., n., and n.e. to its mouth in the gulf of Ob, which it reaches after a course of 2,000 miles. Its chief affluents on the right are the Tom—a swifter stream than the Ob, 400 m. in length, and navigable for the last 280 m. from the beginning of May till July—the Tchulim, and the Ket. The principal affluent on the left is the Irtish, which, rising within the frontier of the Chinese territories, traverses the Altai mountains, and after a course longer than that of the Ob itself, joins that river 250 m. below Tobolsk. The trade of the Irtish, of which the center is Tobolsk, is important. The principal towns on the banks of the Ob are Narim, Sargut, Berezow, and Obdorsk.—The gulf of Ob is a long inlet of the Arctic ocean, 450 m. in length by about 100 m. in breadth. At present only a few steamers ply on the great water-system of the Ob; but that system, communicating as it does between Siberia, the Chinese territories, and European Russia, is, without doubt, destined to become a great commercial thoroughfare. The explorations of prof. Nordenskjöld, but more especially the tentative voyages of capt. Wiggins in 1874 and 1876, from Dundee through the Kara sea to the gulf of Ob, have amply proved the feasibility of this direct route. This river is very rich in fish. Below its junction with the Irtish it divides itself into several parallel streams; and in the flood season it inundates great tracts of country, and presents the appearance of a waste of waters, its desolate uniformity broken only by the occasional tree-tops that rise above the surface. At Obdorsk, about 20 m. s. of the southern border of the gulf of Ob, the river freezes in the middle of October, and breaks up about the middle of May.

OBADI'AH, one of the "minor prophets" of the Old Testament, regarding whom absolutely nothing is known. His book or "vision"—the shortest of the Jewish Scriptures—appears, from internal evidence, to have been composed after the destruction of Jerusalem by the Chaldæans, 588 B.C., and consists of two parts. The first is a prophecy of the downfall of Edom. The second foretells the future redemption and glory of the house of Jacob, in which Edom—for his unbrotherly conduct—shall not share, but, on the contrary, be burned up as "stubble."

OBADIAH (*ante*), the fourth of the minor prophets, according to the Hebrew and English arrangement, and the shortest book in the Old Testament. Some have conjectured that the author of it was the steward of Ahab's household; but this opinion has nothing to support it except the identity of name. There are several striking resemblances between Obadiah and Jeremiah, Joel and others of the minor prophets; but critics have not succeeded in determining to whom priority of date is to be assigned. The better opinion, however, seems to be that Obadiah preceded Jeremiah, or was contemporary with him. His prophecy is a denunciation of Edom, the inhabitants of which are addressed as deceived by their pride and fancied security, from which they would be utterly cast down; and as denounced for their violence against Israel, their refusal to help him, their joy over his calamities, and their profit from his fall. Their doom is to be in the line of their sin; as they had done to others so it should be done to them. In contrast with their sin and destruction, the deliverance and holiness of Zion would be conspicuous; Jacob and Joseph would be as a fiery flame, and Esau would be consumed as stubble. The inhabitants of the south would possess Idumea, and those of the plain, Philistia; Judah would extend to Samaria, Benjamin to Gilead, and the captives of the ten tribes, to the borders of Sidon; saviors would dwell in Zion, and the kingdom would be the Lord's.

O'BAN, a parliamentary burgh and sea-port, Argyleshire, Scotland, on a bay of the same name, 20 m. (in direct line) n.w. of Inveraray. The bay is protected from every wind by the island of Kerrera on the w., and by the high shores of the main-land, and is overlooked on the n. by the picturesque ruins of Dunolly castle. It is from 12 to 24 fathoms deep, and although the girdle of hills that seems to surround it gives it the appearance of a lake, it is easily accessible, and could afford anchorage to 800 sail. Oban is the great rendezvous for tourists in the west Highlands. Its importance dates chiefly from the beginning of the present century. The burgh now contains a number of churches, several hotels and inns, schools, banks, etc. Within 3 m. of Oban is Dunstaffnage castle, which is said to have been the seat of the Scottish monarchy previously to its transference to Scone. The stone of destiny, which now supports the coronation chair in Westminster abbey, and was carried thither from Scone by Edward I., was obtained, in the first instance, according to tradition, from Dunstaffnage castle. Pop. of parliamentary burgh—which is one of the Ayr (q.v.) group—was 1,940 in '61; in '71, 2,426.

OBE, or OBI (etymology unknown), the name given to the magical arts or witchcraft practiced by a class of persons among the negroes of the West Indies. The practicer is called an *obeah-man* or *obeah-woman*. It differs in no essential respect from the corresponding superstitions all the world over. See MAGIC, WITCHCRAFT.

OBEDIENCE, in canon law means the duty by which the various gradations in ecclesiastical organization are held subject, in all things consistent with the law of God or of the church, to the several superiors placed immediately above each, respectively, in the hierarchical scale. Thus priests and inferior clergy owe canonical obedience to the bishop, and priests are bound thereto by a solemn promise administered at ordination. The bishop primitively took a similar oath to the metropolitan; but by the modern law, the jurisdiction of the metropolitan is confined to the occasions of his holding a visitation, or presiding in the provincial synod. Bishops, by the present law of the Roman Catholic church, take an oath of obedience to the pope. This obedience, however, is strictly limited by the canons, and is only held to bind in things consistent with the divine and natural law. In ecclesiastical history the word obedience has a special signification, and is applied to the several parties in the church, which, during the great western schism (q.v.), adhered to the rival popes. Thus we read of the "Roman obedience," which included all who recognized the pope chosen at Rome, and the "Avignon obedience," which meant the supporters of the Avignon pope. So, again, historians speak of "the obedience of Gregory XII.," and "the obedience of Benedict XIII.," etc. Applied to the monastic institute, obedience means the voluntary submission which all members of religious orders vow, at the religious profession, to their immediate superiors, of whatever grade in the order, as well as to the superior general, and still more to the rules and constitutions of the order. This forms, in all orders, one of the essential vows. It is, however, expressly confined to lawful things; and although it is held that a superior can command certain things under pain of sin, yet Roman Catholics repudiate the notion that the command of a superior can render lawful, much less good, a thing which is of its own nature, or by the law of God, sinful or bad. The name obedience is sometimes given to the written precept or other formal instrument by which a superior in a religious order communicates to one of his subjects any special precept or instruction—as, for example, to undertake a certain office, to proceed upon a particular mission, to relinquish a certain appointment, etc. The instruction, or the instrument containing it, is called an obedience, because it is held to bind in virtue of religious obedience.

OBEID', EL, a t. in s. Kordofan, e. central Africa, capital of the province; 250 m. s.w. of Sennaar and about 120 m. w. of the Nile, which forms the e. boundary of the state; pop. about 30,000. The town consist mainly of straw or reed huts, but there are 5 mosques, a market-place, and a hospital. The place is in the midst of a wild plain, and a strong thorn hedge is necessary to keep off the wild beasts at night. The exports are ivory, gold, silver, hides, ostrich feathers, and gums.

O'BEIRNE, THOMAS LEWIS, D.D., 1748–1823; b. Ireland; was educated at St. Omer's, a Roman Catholic college in France; became Protestant, and took orders in the Episcopal church; was chaplain of lord Howe's fleet at the beginning of the American war for independence; in 1776 he preached in St. Paul's, the only Episcopal church in New York city not destroyed by the great fire of that year; in 1782 acted as private secretary to the lord lieut. of Ireland, and received from him in 1783 two valuable livings, in Northumberland and Cumberland; in 1796 he was made bishop of Ossory, and in 1798 was translated to the see of Meath, where he died. He was the author of a *Vindication* of the conduct of admiral and of gen. Howe, some political tracts, and a poem, *The Crucifixion.*

OB'ELISK, a word derived from the Greek *obelos* and *obeliskos*, signifying a spit, applied to prismatic monuments of stone and other materials, terminating with a pyramidal or pointed top. These monuments, called *tekhen*, were placed upon bases before gateways of the principal temples in Egypt, one on each side of the door. They served in Egyptian art for the same purposes as the stelæ of the Greeks and columns of the Romans, and appear to have been erected to record the honors or triumphs of the monarch. They have four faces, are cut out of one piece, and are broader at the base than at the top, at a short distance from which the sides form the base of a pyramidion in which the obelisk terminates. They were placed upon a cubical base of the same material, which slightly surpassed the breadth of their base. Each side of the obelisk at the base measures $\frac{1}{10}$th of the height of the shaft, from the base line to that where the cap, or pyramidion commences. The cap is also $\frac{1}{10}$ of the same height. Their sides are slightly concave, to increase their apparent height. Their height varies from upwards of 100 ft. to a few inches, the tallest known being that of Karnak, which rises to 105 ft. 7 inches. The sides are generally sculptured with hierogylphs and representations, recording the names and titles of kings, generally in one line of deeply-cut hieroglyphs down each side. The pyramid of obelisks was sometimes decorated with subjects. The mode by which they were made appears to have been to hew them first in the rough out of a solid piece in the quarries, and one unfinished specimen thus prepared still remains in the quarries of Syene. They were transported down the Nile during the inundation, on rafts to the spot where they were intended to be placed, and raised from their horizontal position by inclined planes, aided by machinery. Some obelisks, before their erection, had their pyramid capped with bronze gilded, or gold, the marks of such covering still being evident on their surfaces. Under the Roman empire, they were raised by pulleys and heavy tackle. The difficulty of erecting the fallen ones in the ages of renaissance, as also the mechanical appliances for the lowering from its original site the obelisk of Luxor in 1831, and erecting it in the Place de la Concorde in 1833 by Le Bas, show the difficulties experienced by the ancients. The use of obelisks is as old as the appearance of art itself in Egypt; these grand, simple, and geometric forms being used in the 4th dynasty, and continued till the time of the Romans. Their object is enveloped in great obscurity. At the time of the 18th dynasty, it appears that religious ceremonies and oblations were offered to the obelisks, which were treated as divinities. Their sepulchral use is evinced by their discovery in the tombs of the 4th dynasty, and the vignettes of early papyri. No large obelisk is older than that of Matarieh or Heliopolis, erected by Osortesen I. about 1900 B.C.; and that of Beggig or Crocodilopolis is, in reality, only a stele. Thothmes I. placed two of large size before the granite sanctuary of Karnak, and his daughter Hatasu, two others of above 90 ft. high before the second propylæon. Additional sculptures were made on these obelisks by Sethos I., who restored them. Thothmes III. appears to have erected many obelisks. The oldest is that of the Atmeidan or Hippodrome of Constantinople, erected to record his conquests of Naharania or Mesopotamia. Two others, which formerly stood at Heliopolis, were subsequently re-erected by Rameses II. at Alexandria, and have been popularly known as Cleopatra's Needles. One still stands there erect; the other, which long lay prostrate, was after an adventurous voyage brought to London in 1878, and erected on the Thames embankment. The highest of all obelisks, that of St. John of the Lateran, appears to have been removed from Thebes, and set up by Thothmes IV. A small obelisk of Amenophis II., said to have been found in the Thebaid, apparently from Elephantine, is in the collection of the duke of Northumberland at Sion. Sethos I. commenced the Flaminian obelisk, subsequently completed by Rameses II., and placed at the temple of Heliopolis. It was removed to Rome by Constantius, and found 16 ft. under the surface in the pontificate of Gregory XIII., and erected in that of Sextus V. by the architect Fontana. The other obelisks of Rameses II. are, the one at the Luxor quarter of Thebes, the companion of which was removed to the Place de la Concorde at Paris in 1833; the two obelisks of

San or Tanis; that of the Boboli gardens of Florence, transported from the circus of Flora at Rome; the obelisk of the Rotonda at Rome, erected by Clement XII., 1711 A.D.; and that of the Villa Mattei, which decorated the Ara Cœli of the capitol. A fragment of another obelisk was in the Collegio Romano. No obelisks are known of other monarchs till the 26th dynasty. That of the Monte Citorio at Rome, erected by Psammetichus II. at Heliopolis, was transported by Augustus to the Campus Martius, having been exhumed 1748 A.D., and erected by the architect Antinori in that of Pius VI. Two other obelisks of small size, made of black basalt, dedicated by Nekhtherhebi or Nectanebes II, at Hermopolis, commonly known as the obelisks of Cairo, are in the British museum. Ptolemy Philadelphus is said to have erected in the Arsinoeum at Alexandria a plain obelisk of 80 cubics, cut in the quarries by Nectabis. It was set up by the architect Satyrus. Two obelisks, erected by Ptolemy Euergetes II. and his wife Cleopatra, stood before the temple of Philae, one of which was removed to Corfe castle by Mr. Bankes. The so-called Pamphiliano obelisk at Rome, erected by E. Bernin in 1651, in the Piazza Navona, under the pontificate of Innocent X., was removed from the Circus of Maxentius, having, as their hieroglyphical legends testify, been originally erected by Domitian before the Serapeum at Rome. The last of the Roman obelisks was the Barberini, which was found in 1633 on the site of the Circus of Aurelian, and finally erected in 1822 on the Monte Pincio. It was placed by the emperor Hadrian before the mausoleum or cenotaph either of himself or Antinous, between 132–8 A.D. Barbarous hieroglyphs, found on the Sallustian obelisk, are copied from the Flaminian obelisk. It is supposed to have been transported to Rome, unadorned with hieroglyphs, by Sallustius Crispus, prefect of Numidia, and to have been set up in the gardens of Sallust, in the reign of Vespasian. It was erected by Antinori, 1789, before the Church of Trinita del Monte. It has been seen how, on the renaissance of the arts, the obelisks were restored and applied to the embellishments of modern Rome, either as columns in the centers of piazzas or squares, or else as the ornaments of fountains; one obelisk being set up alone in the center of the piazzas and places of Italy and France, while in antiquity they always stood in pairs before the Pylons.

Two small obelisks, and the apex of a third, have been found in Assyria, in shape of truncated prisms, the apices step-shaped. The most interesting is that of the n.w palace of Nimrud, of black marble, is 5 ft. 9 in. high. Each side has five compartments of bas-reliefs, representing the tribute and offerings made to the Shalmanaser. It is covered with a cuneiform inscription, recording the annals of the king's reign, from his first to his 31st year. On it is represented the tribute of Jehu, king of Israel. A second obelisk, of white marble, measures 8 ft. 2 in. high, is covered with bas-reliefs, representing scenes of war and tributes, winding round it like those of a Roman triumphal column. On it is an inscription of Shamas-Pul. The broken apex of a third has a dedication from Ashur-izir-'pul II. An obelisk of Semiramis at Babylon is mentioned by Diodorus, and another of Aricarus was interpreted by Democritus. Under the Roman empire. obelisks were used as gnomons, placed in the public spaces, or erected in the *spina* of the *circi*. The first removal of obelisks to Rome took place in the reign of Augustus, who placed one in the circus, said to been originally erected in the reign of Semenpserteus, 85½ ft. high; and another of 9 ft. less, in the Campus Martins, and had it adjusted as a gnomon by the mathematician Facundus Novus; a third obelisk was erected in the Circus of Caligula and Nero in the Vatican, and originally dedicated to the sun by Nuncoreus, the son of Sesosis, on the recovery of his sight. Two other small obelisks, which decorated the mausoleum of Augustus, and were erected by Claudius or Vespasian and his sons, have been found. Other obelisks are known to have been removed by Constantius, 354 A.D. P. Victor, in his description of the quarters of ancient Rome, reckons 6 of the largest size and 42 others. The Romans added to them brazen spheres and other decorations. Some were removed to Constantinople by Theodosius the younger, and Valentinian, 390 A.D. The translation of the inscription of one of the Roman obelisks made by a Greek or Egyptian, named Hermapion, has been preserved by Ammianus Marcellinus.—Kircher. *Œdipus Ægyptiacus* (tom. iii. Rom. 1652–54); Zoega, *De Origine et Usu Obeliscorum* (fo. Rom. 1797); Cipriani, *Sui Dodici Obelisci di Roma* (fo. Rom. 1828); L'Hôte, *Notice Historique sur les Obélisques Egyptiens* (8vo, Paris, 1836); Birch, *Notes upon Obelisks in the Museum of Classical Antiquities* (8vo, Lond. 1853, pp. 203–39; Layard, *Nineveh and its Remains*, vol. i. p. 346; Sir H. Rawlinson, *A Commentary on the Cuneiform Inscriptions* (12mo, Lond. 1850).

OB'ELISK (*ante*). One of the obelisks of Rameses II. at Alexandria, was removed to London in 1879, and another was given by the khedive of Egypt and brought to this country by the *Dessoug*, commander H. H. Gorringe. It arrived in New York, July 21, 1880, and was set up in Central park, with appropriate ceremonies, and addresses by William M. Evarts and others, Feb. 22, 1881 The expense of removal and erection was defrayed by William H. Vanderbilt, of New York.

OBER-AMMERGAU. See MYSTERIES and MIRACLE PLAYS, *ante*.

OBERLIN, a village in Lorain co., Ohio, on the Lake Shore and Michigan Southern railroad, 34 m. s.w. of Cleveland; the seat of the well-known Oberlin college; pop. '70, exclusive of the students, 2,888. The village has 6 churches, a national bank, a union school-house, a conservatory of music, a hotel, and 2 newspaper offices. The First

Congregetional church is of brick, and will accommodate 3,000 people. The village has a machine shop, a car factory, planing, flour, and saw-mills. It has always been noted for its strictness of morals and its high religious tone.

OBERLIN, JOHANN FRIEDRICH, distinguished for his active benevolence and usefulness, was b. at Strasburg, Aug. 31, 1740; and in 1766 became Protestant pastor of Waldbach, in the Ban de la Roche or Steinthal, a wild mountainous district of Alsace. Here he spent the remainder of his life, combining an affectionate diligence in the ordinary duties of the pastorate, with wise and earnest endeavors to promote the education and general prosperity of the people. The district had suffered terribly in the thirty years' war, and the scanty population which remained was sunk in poverty and ignorance. Oberlin introduced better methods of cultivating the soil, and various branches of manufacture. The population, which was scarcely 500 when he entered on his labors, had increased to 5,000 at the close of the century. Yet, though animated in all his actions by the most pure and disinterested piety, it may be questioned if he did not carry his moral supervision too far when he kept a register of the moral character of his parishioners, and searched with the minuteness though not the motives of an inquisitor, into the most insignificant details of their private life. Oberlin was ably assisted in his reformatory labors by his pious housekeeper, Luise Schepler, who survived her master eleven years. He died June 1, 1826. Notwithstanding the humble sphere in which his days were spent, his fame as a philanthropist has extended over the world, and his example has stimulated and guided many. See *Brief Memorials of Oberlin*, by the rev. T. Sims, M.A. (Lond. 1830), the *Memoirs of Oberlin* (1852), the biography by Bodemann (1868), and that by Spach (Paris, 1866).

OBERLIN COLLEGE, at Oberlin, Lorain co., Ohio, was founded in 1834 as a Christian institution for the liberal education of both sexes under conditions favorable to persons of limited pecuniary resources. It admits students without distinction of sex or color. It has a preparatory department, embracing a classical school with a three years' course, and an English school. The department of philosophy and the arts embraces the classical and scientific or regular "college" course, and the literary course; the study of Greek and in part that of Latin and mathematics being omitted from the latter. The theological department is in close though not official relations with the Congregationalists. It has an endowment of $30,000. The college itself has a fund of $115,000, and scholarships are available to students at a low rate. The college buildings, though plain are spacious and convenient. Number of instructors in 1878, 25; students, 316. President, James H. Fairchild, D.D.

OBERLIN THEOLOGY, designates the peculiar views generally supposed to have been taught at Oberlin college during the earlier years of its history, by its president the rev. Charles G. Finney and his colleagues. Many from without on the one hand looked at the institution through the mists of prejudice and misapprehension; and on the other hand the views actually held and taught within the college were probably improved by increased reflection and growth in the Christian life. 1. The general system of doctrine taught was of a modified Calvinistic type in which the leading thoughts seemed to be that responsibility pertains to the voluntary action of the will, and that every moral agent determines freely for himself, under the pressure of the motives around him, all that is blameworthy or commendable in his character and conduct; that sin is a voluntary failure in duty and holiness a voluntary performance of it; and that a voluntary total moral depravity exists among unregenerate men. The repentance which is a condition of salvation is a forsaking of sin, the obligation to forsake it resting on the sinner, and the power to forsake it being always within his reach. The power to commit sin implies the power to forsake it. The Holy Spirit's work in conversion is a moral work effected by the presentation of motives through the truth; and the consequent work of sanctification is of a similar kind. As God's sovereignty works in harmony with human freedom, one factor in a man's salvation is his own voluntary consent. As sin cannot be imputed where it is not committed, so righteousness cannot be where it is not possessed. Hence the atonement does not include the transfer of human guilt to Christ or of his righteousness to men; but rather so exhibits in the cross of Christ the faithfulness and love of God, in contrast with the sinfulness of man, as to render the forgiveness of the penitent sinner safe and right. 2. The views concerning the nature of virtue taught at Oberlin were at their basis those of president Edwards, making the well-being of the sentient universe the highest ultimate good; and consequently the voluntary regard for this good, which is called benevolence, the vital element in all virtue. 3. The Oberlin doctrine of sanctification is determined by the view taken of moral action as necessarily right or wrong; and therefore of moral character as being necessarily at any one instant, either perfectly holy or perfectly sinful. If this be so, conversion necessarily becomes entire consecration, and obedience and faith are essentially complete. The difficulty with the Christian is that he is weak, inexperienced, and liable to temptation. Sanctification therefore becomes a gradual attainment of experience and strength, through repeated enlightenments by the Holy Spirit, accompanied by patient continuance in well doing. And the baptism of the Holy Spirit is to be sought by prayer with faith in the promise of Christ. The Oberlin theology has of late years lost its distinctness, and has been merged in the general current of Christian doctrine.

O'BERON, the king of the elves or fairies, and the husband of Titania. The name is derived by a change of spelling from *Auberon*, more anciently *Alberon*, and that from the German *Alberich*, i.e., king of the Elves. Oberon is first mentioned as "Roi du royaume de la féerie" in the old French poem of *Huon de Bordeaux, pair de France*, which was afterwards made the basis of a popular prose romance. From the French, Oberon was borrowed by the English poets, Chaucer, Spenser, and others, but he is most familiarly known from his appearance in Shakespeare's *Midsummer Night's Dream*. From old French sources, also, Wieland derived part of the materials of his poem of *Oberon*.

OBE'SITY, or CORPULENCE, may be defined to be "an accumulation of fat under the integuments or in the abdomen, or in both situations, to such an amount as to embarrass the several voluntary functions." A certain degree of fatness is not only quite compatible with health, but, as has been shown in the article FATS, ANIMAL, the fatty tissue is of considerable use in the animal body, partly in consequence of its physical, and partly in consequence of its chemical properties; and it is only when the fatness begins to interfere with the discharge of any of the vital powers, that it can be regarded as a morbid condition. Obesity may occur at any period of life, but it is most commonly after the fortieth year that the tendency to an inordinate accumulation of fat begins to show itself. After that time, in the case of men, the pleasures of the table are usually more attractive than in earlier life, and much less muscular exercise is taken; while in women, the cessation of the power of child-bearing induces changes which tend remarkably to the deposition of fat. The extent to which fat may accumulate in the human body is enormous. Daniel Lambert, who died at the age of forty years, weighed 739 lbs.; his exact height is not recorded, but, according to the investigations of the late Dr. Hutchinson (the inventor of the spirometer), the normal weight of a man 6 ft. high should not exceed 178 lbs. Dr. Elliotson has recorded the case of a female child, a year old, who weighed 60 lbs.; and those who are interested in the subject will find a large collection of cases of obesity in Wadd's *Cursory Remarks on Corpulence*.

The predisposing causes of obesity are a peculiar habit of body, hereditarily transmitted; inactivity; sedentary occupations, etc.; while the more immediate or exciting causes are a rich diet, including fatty matters, and matters convertible in the body into fats, such as saccharine and starchy foods, and the partaking of such a diet to a greater extent than is necessary for balancing the daily waste of the tissues. "Fat meats, butter, oily vegetable substances, milk, saccharine and farinaceous substances are the most fattening articles of food; whilst malt liquors, particularly rich and sweet ale are, of all beverages, the most conducive in promoting obesity. The fattening effect of figs and grapes, and of the sugar-cane, upon the natives of the countries where these are abundant, is well known. In various countries in Africa and the east, where obesity is much admired in females, warm baths, indolence, and living upon saccharine farinaceous articles, upon dates, the nuts from which palm-oil is obtained, and upon various oily seeds, are the means usually employed to produce this effect."—Copland's *Dictionary of Medicine*, article "Obesity." The knowledge of the means of inducing obesity affords us the best clue to the rational treatment of this affection. It is a popular belief that the administration of acids—vinegar, for example, or one of the mineral acids—will check the deposition of fat; but if the desired effect is produced, it is only at the cost of serious injury to the digestive, and often to the urinary organs. The employment of soap and alkalies, as advocated a century ago by Dr. Flemyng (*A Discourse on the Nature, Causes, and Cure of Corpulency*, 1760), is less objectionable than that of acids, but the prolonged use even of these is usually prejudicial. The efficacy of one of our commonest seaweeds, sea-wrack (*Fucus vesiculosus*), in this affection has also been strongly advocated. It is prescribed in the form of an extract, and its value is probably dependent on the iodine contained in it.

A very interesting *Letter on Corpulence*, published in 1863 by Mr. Banting, in which he records the effect of diet in his own case, after all medicinal treatment had failed, is well worthy of the attention of those who are suffering from the affection of which this article treats. The following are the leading points in his case. He was 66 years of age, about 5 ft. 5 in. stature (and therefore, according to Dr. Hutchinson's calculations, ought to have weighed about 142 lbs.), and in Aug., 1862, weighed 202 lbs. "Few men," he observes, "have led a more active life . . . . so that my corpulence and subsequent obesity were not through neglect of necessary bodily activity, nor from excessive eating, drinking, or self-indulgence of any kind, except that I partook of the simple aliments of bread, milk, butter, beer, sugar, and potatoes, more freely than my aged nature required . . . . I could not stoop to tie my shoe, nor attend to the little offices humanity requires without considerable pain and difficulty; I have been compelled to go down stairs slowly backwards, to save the jar of increased weight upon the ankle and knee joints, and been obliged to puff and blow with every slight exertion" (pp. 10 and 14).

By the advice of a medical friend, he adopted the following plan of diet: "For breakfast I take 4 or 5 ounces of beef, mutton, kidneys, broiled fish, bacon, or cold meat of any kind except pork; a large cup of tea (without milk or sugar), a little biscuit, or one ounce of dry toast. For dinner, 5 or 6 ounces of any fish except salmon, any meat except pork, any vegetable except potato, one ounce of dry toast, fruit out of a pudding, any kind of poultry or game, and 2 or 3 glasses of good claret, sherry, or Madeira: champagne, port, and beer forbidden. For tea, 2 or 3 ounces of fruit, a rusk or two, and a cup of tea without milk or sugar. For supper, 3 or 4 ounces of meat or fish, similar to dinner, with a glass or two of claret (p. 18). I breakfast between 8 and 9 o'clock, dine between 1 and 2; take my slight tea meal between 5 and 6; and sup at 9" (p. 40). Under this treatment he lost in little more than a year (between Aug. 26, 1862, and Sept. 12, 1863) 46 lbs. of his bodily weight, while his girth round the waist was reduced 12¼ inches. He reported himself as restored to health, as able to walk up and down stairs like other men; to stoop with ease and freedom; and safely to leave off knee-bandages, which he had necessarily worn for 20 years past. He made his own case widely known by the circulation of his pamphlet (which has passed through several editions); and "numerous reports sent with thanks by strangers as well as friends," show that "the system is a great success;" and that it is so we do not doubt, for it is based on sound physiological principles. (Mr. Banting died in 1878.)

OBI, or OBEAH. See OBE, *ante.*

ÓBI'ON, a co. in n.w. Tennessee bordering on Kentucky; drained by the Obion river and its creeks, intersected by the Mobile and Ohio, and the Nashville and St. Louis railroads; 530 sq.m.; pop. '80, 22,923—22,807 of American birth, 4,065 colored. The surface is mostly level and fertile; there are extensive forests; Indian corn, wheat, cotton, tobacco, sweet-potatoes, and wool are the staples. Co. seat, Troy.

O'BIT (Lat. *obitus*, a "going down," "death") literally means the decease of an individual. But as a certain ecclesiastical service was fixed to be celebrated on the day of death (*in die obitus*), the name came to be applied to the service itself. Obit therefore signifies, in old church language, the service performed for the departed. It consisted, in the Roman church, of those portions of the *officium defunctorum* which are called matins and lauds, followed by a mass for the dead, chanted or occasionally read. Similar services are held on the day fo the funeral, and on the 30th day, and the anniversary; and although the name obit was primitively applied only to the first, it has come to be used of them all indiscriminately.

OBITER DICTUM, a Latin expression meaning, literally, "said by the way" and used in law to denote an expression of opinion by the court in deciding a case which does not bear upon any point directly involved in the case. Such an opinion does not have the force of a precedent, and as it is given without hearing argument is not as likely to be as well considered and precise as opinions on questions direct and not collateral. On the other hand the train of reasoning which leads to a given conclusion can often appear only by examining the side issues and using analogous principles as illustrations. The practice of courts in this respect, and especially where the right of appeal exists, is certainly freer than in the past; and though such utterances may not be authoritative they are often of practical value.

OBJECT, in the language of metaphysics, is that of which any thinking being or *subject* can become cognizant. This subject itself, however, is capable of transmutation into an object, for one may think about his thinking faculty. To constitute a metaphysical object, actual existence is not necessary; it is enough that it is conceived by the subject. Nevertheless, it is customary to employ the term objective as synonymous with real, so that a thing is said to be "objectively" considered when regarded in itself, and according to its nature and properties, and to be "subjectively" considered, when it is presented in its relation to us, or as it shapes itself in our apprehension. Skepticism denies the possibility of objective knowledge; i.e., it denies that we can ever become certain that our cognition of an object corresponds with the actual nature of that object. The verbal antithesis of objective and subjective representation is also largely employed in the fine arts, but even here, though the terms may be convenient, the difference expressed by them is only one of degree, and not of kind. When a poem or a novel, for example, obtrudes the peculiar genius of the author at the expense of a clear and distinct representation of the incident and character appropriate to itself, we say it is a subjective work; when, on the contrary, the personality of the author retires into the background, or disappears altogether, we call it objective. The poems of Shelley and Byron: the novels of Jean Paul Richter, Bulwer Lytton, and Victor Hugo; and the paintings of the preraphaelites belong essentially to the former class; the dramas of Shakespeare, the novels of Scott, and the poems of Goethe to the latter.

OBJECT-GLASS, the glass in a telescope (q.v.) or microscope (q.v.), which is placed at the end of the tube nearest the object, and first receives the rays of light reflected from it.

OBLATES (Lat. *oblatus, oblata,* "offered up"), the name of a class of religious bodies in the Roman Catholic church, which differ from the religious orders strictly so called, in not being bound by the solemn vows of the religious profession. The institute of oblates was one of the many reforms introduced in the diocese of Milan by St. Charles Borromeo, toward the close of the 16th century. The members consisted of secular priests who lived in community, and were merely bound by a promise to the bishop to devote themselves to any service which he should consider desirable for the interest of religion. St. Charles made use of their services chiefly in the wild and inaccessible

Alpine districts of his diocese. This institute still exists, and has been recently introduced into England. Still more modern are the "oblates of the blessed virgin Mary," a body of French origin, which arose in the present century, and has been very widely extended; and whose chief object is to assist the parochial clergy, by holding missions for the religious instruction of the people in any district to which they may be invited. This body also has been established in England and in Ireland. Other similar institutes might be enumerated, but the constitution of all is nearly the same. There is also a female institute of oblates, which was established in Rome, about 1440, by St. Francisca of Rome, and which consists of ladies associated for charitable and religious objects, and living in community, but bound only by promise, and not by vow.

OBLIGATION is a term used in Scotch law to denote the binding effect of any legal contract, and is often used synonymously with contract or promise. An obligation is said to be pure when it may be instantly demanded (called in England an absolute contract). An obligation is conditional when it depends for its legal effect on some events which may or may not happen. Obligations are also divided into verbal and written.

OBLIGATION OF CONTRACTS, the legal bond which demands that the contracting parties shall carry out their agreement, and including the right to enforce the contract by legal procedure. This extension of the word obligation to include the legal effect and remedy is important, and upon the subject the United States supreme court has said that "the laws which exist at the time and place of making the contract and where it is to be performed enter into and form a part of it. This embraces alike those which affect its validity, construction, discharge, and enforcement." In the United States constitution, art. I. sec. 10, is found this provision: "No state shall pass . . . any bill of attainder, *ex post facto* law, or any law impairing the obligation of contracts." The questions at once arise: What are the obligations of a contract; to what contracts does the prohibition apply, and what laws are of such a nature as to violate that prohibition? The first question is answered in the definition given above, and it should be added that the legal bond is derived from those laws only which were in existence at the time of the contract and thus supposed to be in the contemplation of the parties. As to the second, all contracts are embraced within the meaning of the law, if they respect rights or claims which could be brought before a court of law or equity, whether they are expressed or implied, executed or executory. Conveyances, statutory grants, and private charters issued by a state undoubtedly come within the prohibition. Against this the states have protested, but in the great Dartmouth college case the supreme court decided that a private charter is a contract between the state and the corporation, and cannot be repealed or impaired by subsequent legislation, and that such collateral stipulations as exemption from taxation are of the essence of the contract. This decision has been many times reaffirmed but is still doubted by many eminent lawyers on the ground that a state cannot sell by contract its sovereign functions. Municipal corporations have no such immunity as to their charters, as they are political in their nature. The contract of marriage has been held not to be of such a nature as to create obligations in the sense used in the constitution, but on the other hand it has been said that a law creating new grounds for the divorce of parties married before its passage would impair the obligation of the marriage contract and would therefore be unconstitutional. As to remedies for violation of contract obligations, it is not considered that the state impairs the obligation by changing the nature and extent of the relief offered, or by varying the time and mode in which these remedies may be pursued, or by barring all relief after a prescribed time. The case would be different were all remedies to be abolished. The right of the state to pass regulations for preserving public order, health, and morality is not to be restrained by a forced interpretation of the clause of the constitution under discussion. The right of a state legislature to forever exempt from taxation any property, and thus to bind its successors and, as it were, compromise the sovereignty of the state, is not yet fully settled; but the prevailing doctrine seems to be that such exemption may be made for good or valuable consideration, as all property rights are subject to the state powers of taxation and eminent domain. Congress has been given the power of passing general bankrupt laws, but this power is not exclusive; such laws, however, passed in aid of debtors, as stay laws, exemption laws, or statutes of limitation, conflict with the prohibition of impairment of obligations when they are so framed as to act retrospectively. Licenses, public offices, and permission by statute to do certain acts, as to sue the state, are not in their nature contracts; no consideration exists, and the grant may be repealed without impairing any contract obligation. Thus it has repeatedly been held that license to establish a lottery or to carry on a dangerous manufacture may at any time be revoked. It will be noticed that the constitution does not extend the prohibition of impairment to congress as well as to the states, and however opposed to common honesty and public policy such an act would be, there is little doubt that congress has the legal power to pass such laws.

OBLIGA'TO, in music. When a musical composition is constructed in more than one part, any part is said to be obligato which is not merely employed to strengthen the others, but is necessary to the melodic perfection of the whole. An accompaniment is said to be obligato which does not consist of mere chords, but has its own melody.

O'BOE. See Hautboy.

OB'OLUS (Gr. *obolos* or *obelos*, a spit), the smallest of the four common Greek coins and weights, was originally, as is generally supposed, a small piece of iron or copper, similar in form to the head of a spit, or spear head, whence its name. In this form it was used as a coin, and a handful of "oboli" was equivalent to a drachma (q.v.). It was subsequently coined of silver, and in the ordinary round form, but still retained its original name; its value, both as a coin and a weight, was now fixed as the ⅙ part of a drachma. so that in the Attic system it was equivalent to 1⅝d. and 15⅜ Troy grains respectively: while the Æginetan obolus was worth 2¼d. as a coin, and 25⅜ Troy grains as a weight. Multiples and submultiples of this coin were also used, and pieces of the value of 5, 4, 3, 2, 1½ oboli, and of ¾, ½, ⅓, and ¼ of an obolus respectively, are to be found in collections of coins.

OB'OLUS, in natural history. See Invertebrate Animals, sub-kingdom mollusca, division A; class III. family 10.

OBOOKI'AH, Henry, b. in the island of Hawaii, about 1795. In his childhood in a civil war his parents were killed before his eyes. Taking his infant brother upon his back, and attempting to escape, his brother was pierced through with a spear, and he was made prisoner and taken to the house of the man who had killed his parents. His uncle, the high priest of the island, found him here and took him home. He was kindly treated by his uncle, but he was unhappy, often weeping day and night. He gladly in 1805 embarked to come to the United States with capt. Brintnal of New Haven, Conn., and for a while resided with the captain. He attended church, and showed a great desire for instruction, lingering about the college buildings. Finding the desire unattained, and thinking of the students there who were enriching their minds with the treasures which were inaccessible to him, he sat down weeping on the threshold. The Rev. Edwin W. Dwight, a resident graduate, found him there, and taking him to his house, gave him instruction. Samuel J. Mills visiting New Haven soon became acquainted with him, and Henry expressed a desire to "learn to read the Bible, and go back to his native islands and tell the people of God. Mills took Henry to his father's house in Torringford, where he rapidly improved in religious and secular knowledge. Afterward he accompanied Mr. Mills to Andover, where he spent two years. By invitation of James Morris, he spent the winter of 1813 at the Litchfield grammar school. In the autumn of 1814 by advice of friends he placed himself under the care of the North consociation (Congregational) of Litchfield co., for the direction of his studies; and Nov. 15, 1815, he was received under the care of the American board. A foreign mission school having been established at Cornwall, Conn., Obookiah was placed there to be educated. But on Feb. 17, 1818, he was stricken with fever, and soon died. But he had not lived in vain. His earnest desire for an education, shown in New Haven, led to the establishment of the Cornwall school, and the education of several of his countrymen, and to the awakening of the Christian community to a deep interest for the Sandwich islands; to which a mission was commenced soon after his death.

O'BRIEN, a co. in n.w. Iowa, drained by Little Sioux river, and Willow creek; on the Chicago, Milwaukee, and St. Paul railroad; 576 sq.m.; pop. '70, 715—649 of American birth. The surface is mostly prairie, and the soil fertile. The principal productions are corn, wheat, oats, and barley. Co. seat, Primgar.

O'BRIEN, Fitz-James, 1829–62; b. Ireland; emigrated to America in 1850, and, in April 1861, joined the New York 7th regiment. In the following January he was placed on the staff of gen. F. W. Lander, was wounded in a skirmish Feb. 16, 1862, and died from the effects of a surgical operation. He was a contributor in prose and verse to the *Atlantic Monthly*. He was happy in his choice of themes, especially for his poetical work, and he gave them noble treatment, vigorous but refined. He was a brave soldier. He is called the ablest of those of the New York Bohemians, from 1850 to 1862, who are now dead. He was a member of that literary coterie to which Charles G. Halpine, E. C. Stedman, Walt Whitman, and T. B. Aldrich belonged, and in a publication of the present year entitled *Life, Poems, and Stories of Fitz-James O'Brien*, edited by William Winter, who knew him well, are included his stories, most distinguished for imaginative ability and literary art, *The Diamond Lens* and the *Golden Ingot*.

O'BRIEN, Jeremiah, 1740–1818; b. Ireland; came to this country and settled in Maine; in 1775, with only a few assistants, struck the first hostile blow in the American waters, capturing the Margaretta, a British armed vessel, for which act he was appointed capt. of privateers. Soon afterwards he captured other English vessels, and was commissioned capt. in the state navy, but finally was made prisoner, and confined in the prison-ship Jersey for six months, then sent to England and placed in Mill prison, but a year later escaped, and returned to Maine. He held the office of collector at Machias, at which place he died.

O'BRIEN, William Smith, b. in 1803, was the second son of the late sir Edward O'Brien, bart. of Dromoland, in the county of Clare, Ireland, and uncle of the present lord Inchiquin; that ancient barony having recently passed to the Dromoland O'Briens on the failure of the elder branch. William S. O'Brien was educated at Harrow school, whence he passed to Trinity college, Cambridge. He entered parliament for the borough of Ennis in 1826, and was a warm supporter of Catholic emancipation. In 1835 he was returned on advanced liberal principles for the county of Limerick, and for several years strongly advocated the claims of Ireland to a strictly equal justice with England, in legislative as well as executive measures. Professing his inability to effect this in the united legislature, and having embroiled himself with the speaker by refusing to serve on committees (for which refusal he was committed to prison in the house by the speaker's order), he withdrew from attendance in parliament in 1841, and joined actively with Daniel O'Connell (q.v.) in the agitation for a repeal of the legislative union between England and Ireland. In the progress of that agitation, a division having arisen on the question of *moral* as against *physical force* between O'Connell and the party known as "young Ireland," O'Brien sided with the latter; and when the political crisis of 1848 eventuated in a recourse to arms, he took part in an attempt at rebellion in the s. of Ireland, which in a few days came to an almost ludicrous conclusion. He was in consequence arrested, and, having been convicted, was sentenced to death. The sentence, however, was commuted to transportation for life; and after the restoration of tranquillity in the public mind in Ireland, he, in common with the other political exiles, was permitted to return to his native country. From that date (1856) he spent much of his time in foreign travel; and although he wrote more than once in terms of strong disapproval of the existing state of things, he invariably abstained from all active share in the political proceedings of any party. He died June, 1864.

OBSCENE PRINTS, BOOKS, or **PICTURES,** exhibited in public render the person so doing liable to be indicted for a misdemeanor. Persons exposing them in streets, roads, or public places, are also liable to be punished as rogues and vagabonds with hard labor. An important change in the law was effected by lord Campbell's act (20 and 21 Vict. c. 83), which was passed to suppress the traffic in obscene books, pictures, prints, and other articles. Any two justices of the peace, or any police magistrate, upon complaint made before him on oath that such books, etc., are kept in any house, shop, room, or other place, for the purpose of sale, or distribution, or exhibition for gain or on hire, and that such things have been sold, etc., may authorize a constable to enter in the day-time, and, if necessary, use force by breaking open doors, or otherwise to search for and seize such books, etc., and carry them before the magistrate or justices, who may, after giving due notice to the occupier of the house, and being satisfied as to the nature and object of keeping the articles, cause them to be destroyed.

OBSCENE PRINTS, BOOKS, or PICTURES (*ante*). By U. S. revised statutes, sec. 2,491, all persons are prohibited from importing into the United States from any foreign country any obscene book, pamphlet, paper, writing, advertisement, circular, print, picture, drawing, or other representation, figure, or image, on or of paper or other material, or any instrument or drug for any immoral purpose. No invoice or package containing such articles shall be admitted at the custom house. Any judge of any U. S. district or circuit court, before whom complaint in writing is made upon knowledge or belief, and if upon belief, setting forth the grounds of such belief, supported by complainants' oath, may issue a warrant to any marshal or deputy marshal to search for and seize such immoral articles, and to make return so that they may be condemned and destroyed. The proceedings, as in other cases of municipal seizure, are subject to appeal or writ of error. It was held in *The U. S.* vs. *One case of Stereoscopic Slides*, Sprague, 407, that where an invoice contains any immoral articles, the whole is forfeited. By sec. 3,878, obscene publications, etc., are excluded from the mails. By sec. 3,893 any person who shall knowingly deposit in or take out from the mails such things for the purpose of circulation or distribution, shall be guilty of a misdemeanor, and for each offense be fined not less than $100 or more than $5,000, or imprisoned not less than one year or more than 10 years, or both at the discretion of the court. The prohibition of these statutes is against every article or thing intended or adapted to any obscene, indecent, or immoral use. By sec. 5,389, every person in the district of Columbia, or any of the territories, or elsewhere within the United States jurisdiction, who sells, lends or gives away, or in any manner exhibits or publishes or offers to publish any obscene publication etc., shall be punished with hard labor in the penitentiary for not less than 6 months, or more than 5 years for each offense, or shall be fined not less than $100 or more than $2,000 with costs. By sec. 1785, any officer, agent, or employee of the United States who violates laws against obscene literature etc., is guilty of misdemeanor, and for each offense, shall be fined not less than $100, nor more than $5,000, or shall be imprisoned at hard labor for not less than one year, nor more than 10 years or both.

OBSCURAN'TISTS, the name given, originally in derision, to a party who are supposed to look with dislike and apprehension on the progress of knowledge, and to regard its general diffusion among men, taken as they are ordinarily found, as prejudicial to their religious welfare, and possibly injurious to their material interests. Of those who avow such a doctrine, and have written to explain and defend it, it is only just to say that they profess earnestly to desire the progress of all true knowledge as a thing good in itself; but they regard the attempt to diffuse it among men, indiscriminately, as perilous, and often hurtful, by producing presumption and discontent. They profess but to reduce to practice the motto—

A little learning is a dangerous thing.

It cannot be doubted, however, that there are fanatics of ignorance as well as fanatics of science.

OBSEQUIES. See FUNERAL RITES, *ante*.

OBSERVANTISTS, or OBSERVANT FRANCISCANS, Under the head FRANCISCANS (q.v.) has been detailed the earlier history of the controversies in that order on the interpretation of the original rule and practice established by St. Francis for the brethren, and of the separate organization of the two parties at the time of Leo X. The advocates of the primitive rigor were called *Observantes*, or *Strictioris Observantiæ*, but both bodies were still reputed subject, although each free to practice its own rule in its own separate houses, to the general administrator of the order, who, as the rigorists were by far the more numerous, was a member of that school. By degrees, a second reform arose among a party in the order, whose zeal the rigor of the observantists was insufficient to satisfy, and Clement VII. permitted two Spanish friars, Stephen Molena and Martin Guzman, to carry out in Spain these views in a distinct branch of the order, who take the name of *reformati*, or reformed. This body has in later times been incorporated with the observantists under one head. Before the French revolution, they are said to have numbered above 70,000, distributed over more than 3,000 convents. Since that time, their number has, of course, been much diminished; but they still are a very numerous and widespread body, as well in Europe as in the new world, and in the missionary districts of the east. In Ireland and England, and for a considerable time in Scotland, they maintained themselves throughout all the rigor of the penal times. Several communities are still found in the two first-named kingdoms.

OBSERVATION AND EXPERIMENT are the leading features of modern science, as contrasted with the philosphy of the ancients. They are indispensable as the bases of all human knowledge, and no true philosophy has ever made progress without them, either consciously or unconsciously exercised. Thus, by Socrates, Plato, and Aristotle, no less than by Archimedes and the ancient astronomers, observation and experiment are extensively though not prominently or always obviously employed; and it was by losing this clue to the spirit of their master's teaching, that the later disciples in these schools of philosophy missed the path of real progress in the advancement of knowledge. It was in the latter half of the 16th c. that the minds of philosophers were first *consciously* awakened to the importance of observation and experiment, as opposed to authority and abstract reasoning. This result was first occasioned by the discoveries and controversies of Galileo in Florence; and to the same end were contributed the simultaneous efforts of a number of philosophers whose minds were turned in the same direction—Tycho Brahe in Holland, Kepler in Germany, William Gilbert in England, who were shortly afterwards followed by a crowd of kindred spirits. The powerful mind of Francis Bacon lent itself to describe the newly awakened spirit of scientific investigation, and though he ignored or affected to despise the results achieved by the great philosophers just mentioned, he learned from them enough to lay the foundation of a philosophy of inductive science, which, if we look at the course of scientific progress since his day, seems to have been almost prophetic. The difference between observation and experiment may be said to consist in this, that by observation we note and record the phenomena of nature as they are presented to us in her ordinary course; whereas by experiment we note phenomena presented under circumstances artificially arranged for the purpose. Experiment is thus the more powerful engine for discovery, since one judiciously conducted experiment may provide the data which could only result from a long course of observations.

OBSERVATORY, an institution supplied with instruments for the regular observation of natural phenomena, whether astronomical, meteorological, or magnetical. In some observatories all three classes of observation are carried on, but in most cases special attention is paid to astronomy alone, and only such meteorological observations are taken as are required for the calculation of the effect of atmospheric refraction on the position of a heavenly body; there are, however, a few observatories which are devoted solely to meteorological or magnetical observations. Confining our attention to astronomical observatories, it will be convenient to divide them into two classes—public and private observatories—the former being devoted to those observations which from their nature require to be continued on the same system for long periods of time, whilst the latter are usually founded for some special object, which may be attained with a comparatively small expenditure of time and labor.

The most important work which is carried out in public observatories is the determination of the movements of the sun, moon, and planets among the stars; and as a corollary to this, the relative positions of the stars to which the other heavenly bodies are referred. In early times the Greek astronomers fixed these positions by means of armillary spheres and astrolabes, having concentric graduated circles, on which the latitudes and longitudes could be read off, when a pair of sights was pointed to the heavenly body. Ptolemy made use of a quadrant, with which he measured zenith distances on the meridian; and many centuries after, Tycho Brahé converted this form of instrument into an altazimuth by mounting it on a vertical axis in connection with a horizontal or azimuth circle. With this instrument Tycho Brahé made a long series of observations of the altitudes and azimuths of the heavenly bodies at the observatory which the king of Denmark erected for him, and he also measured with great assiduity their angular distances from each other by means of a sextant, a method of observation which Flamsteed afterward employed with a much improved form of the instrument, and which is now extensively used with the reflecting sextant, for finding the longitude at sea. It was not till the middle of the last c., that the improvement of the clock by Graham enabled astronomers to rely on it for the determination of right ascensions by the times of passage across the meridian, instead of by measuring them with a graduated circle. The quadrant was then fixed in the meridian, and being attached to a massive wall, its dimensions were increased, and greater accuracy thereby secured in the determination of meridian zenith distances. Two such instruments pointing respectively n. and s. were erected at the royal observatory, Greenwich, and used by Bradley and his successors from 1750 till they were displaced by the mural circle (see CIRCLE, MURAL), an instrument vastly superior in principle, since the troublesome errors of centering of the quadrant were got rid of by combining the readings of opposite parts of a graduated circle, whilst the effect of division errors was much reduced by taking the mean of the readings at 6 or 8 equidistant points of the circle. At the same time, the accuracy of the readings was greatly increased by the invention of the micrometer-microscope, which made it possible to measure spaces to $\frac{1}{100000}$ of an inch. Neither the quadrant nor the mural circle, however, could be relied upon for accurate motion in the plane of the meridian, but Römer remedied this defect by inventing a separate instrument, the transit (q.v), which enabled astronomers to observe the times of meridian passage or transit with great accuracy, and thus to determine the differences of right ascension of the heavenly bodies by means of the apparent diurnal movement. With the transit and quadrant Bradley commenced that series of observations of the positions of the sun, moon, and planets, and of stars for reference, which have been continued ever since at Greenwich, and on which, in combination with less extensive series at Paris and Königsberg, all our tables of the motions of the heavenly bodies are founded. In modern observatories, the transit and mural circle are combined into one instrument, the transit-circle, a change which has been rendered possible chiefly by the improvement in graduated circles since the invention of Troughton's dividing engine, the unwieldy size of the old quadrants and mural circles necessitating an attachment to a massive wall. Although Reichenbach made transit-circles at the beginning of this c. for several foreign observatories, including that of Dorpat, the lightness of their structure and their want of stability prevented their being introduced generally, and the mural circle held its place in the principal observatories till sir George Airy designed the Greenwich transit-circle in 1851, an instrument of a most massive character, which has served as model for nearly all that have been constructed in recent years. The main features of the modern transit-circle are: (1) that it is not reversible, its collimation error being determined by means of two collimators, or reversed telescopes pointing at each other and at the transit telescope, n. and s. respectively; (2) that a spirit-level is not used, the level error being found by means of the reflection of the wires from the horizontal surface of mercury. These two negative characteristics, while admitting of great massiveness in construction (the Greenwich instrument weighs more than a ton), have removed three troublesome sources of error—inequality in the pivots, lateral flexure of the telescope in the process of reversion, and the effect of currents of heated air on a spirit-level. An important auxilliary to the transit-circle is the chronograph, an American invention, which, in various forms, is now found in all well-equipped observatories, the principle in all cases being the same—viz., the registration on a revolving cylinder of paper of the times of transit across the system of spider-lines of the transit-circle, as well as of the seconds of the sidereal clock, by means of electric currents, which pass through electro-magnets, when the circuit is closed either by the observer or the clock, thus causing a momentary attraction of a piece of soft iron, and producing a corresponding mark on the paper either with a pen or a steel point. This system, while improving somewhat the accuracy of the individual observations, admits of a large number being made at intervals of two or three seconds, and leaves the observer free to make several observations of zenith distance during the passage of a star across the field of view. Allusion has been made to the importance of the sidereal clock in modern astronomy. Considerable improvements have been made in its construction since Graham's time, the original gridiron pendulum having been replaced successively by the mercurial and the zinc and steel, and the dead-beat escapement by Dennison's gravity and Airy's detached escapement. Recently an apparatus depending on the attraction of a movable magnet connected with a float in a siphon barometer has been applied by sir George Airy to the sidereal clock at Greenwich, to correct for the effect of variations in the atmospheric pressure on the motion of the pendulum. This clock is placed in a basement which is kept at a nearly uniform temperature, an important condition, which has contributed to make its peformance very far superior to that of any other clock hitherto constructed, and fully equal to the requirements of the methods of observation now in use. With instruments such as have just been described, regular observations of the sun, moon, and planets, and of fundamental stars, are made at Greenwich, Paris, Washington and Oxford, supplemented at the first-named observatory by extra-meridian observations of the moon with a massive altazimuth, which can be employed when the moon is too near new moon to be seen on the meridian in full daylight, and which is in fact used to secure an observation on every night when the moon is visible.

The observations of stars at these four observatories are directed to the most accurate determination of the places of a limited number, and the deduction of their proper motions by comparison with the results obtained by Bradley, Piazzi (with an altazimuth by Ramsden at Palermo), and Groombridge; but at other observatories differential or zone observations of large numbers of stars have been made, with the object of making a complete and tolerably accurate survey of the heavens, the rhomb or ring micrometer being used for this purpose. Among those who have devoted themselves to this work may be mentioned Lacaille at the cape of Good Hope, Lalande at Paris, Bessel at Königsberg, and Argelander at Bonn. These zone-observations are now being repeated with the transit-circle at a number of observatories, associated together for the purpose of getting far more accurate places than was possible with the equatorial. A large number of observatories, chiefly in Germany and America, are devoted to a very different class of observations—viz., differential observations with the equatorial (q.v.) of comets and small planets as referred to comparison-stars, and the search for such objects; whilst at other observatories, among which that of Pulkowa may be mentioned, the measurement of double stars with the micrometer is laid down as the chief object. Of late years two new subjects have been introduced in the routine of observatory work—photography and spectroscopy. The former was carried on for many years at Kew observatory under Mr. de la Rue's auspices, and at his private observatory at Cranford, and the work is now being continued at Greenwich: the latter has been taken up at a number of Italian observatories, and particularly at Rome by P. Secchi, and it now forms part of the regular system at Greenwich; whilst the observatories at Paris, Berlin, and Vienna are equipped for these physical observations, and in America and Australia they are vigorously carried on at several observatories—Melbourne, in particular, being provided with a four-feet equatorial reflector for this purpose, as well as for the examination of nebulæ. The most important work of an observatory, however, consists, not in making observations, which are easily multiplied, but in reducing and publishing them—a task of far greater labor, and requiring far higher qualifications. However various may be the observations, the method of eliminating their errors is the same in all cases, and similar mathematical considerations apply to their reduction, whether they be meridian observations, micrometer measures, measures of photographs, or spectroscopic observations; and it is when such treatment is required in any inquiry that it should be undertaken at a public observatory, where this rigorous method will be applied.

The work of private observatories hardly admits of being specified, though its general character has already been indicated; it may suffice to mention the observations of double stars and nebulæ by the two Herschels, Groombridge's catalogue of circumpolar stars, Smyth's double-star measures, Carrington's Redhill catalogue and solar observations, the nebular observations of Lord Rosse and Mr. Lassell, De la Rue's long series of photographs, and the spectroscopic observations of Huggin's and Lockyer.

In addition to regular astronomical observations of all kinds, national observatories are usually charged with the distribution of time signals, and the rating of chronometers for the navy—matters of great practical importance, especially in this country, where Greenwich time is communicated directly by telegraph to more than six hundred towns.

OBSIDIAN, a mineral accurately described by Pliny under the name which it still bears. It is a true kind of native glass, composed of silica (from 70 to 80 per cent), alumina, lime, soda, potash, and oxide of iron. It is hard and brittle, with remarkably vitreous luster, and perfectly conchoidal fracture, the edges of the fractures very sharp and cutting like glass. It varies from semi-transparency to translucency only on the edges. It is often black, or very dark gray; sometimes green, red, brown, striped, or spotted; and sometimes *chatoyant* or *avanturine*. It occurs in volcanic situations, and often in close connection with pumice, in roundish compact pieces, in grains, and in fibers. It is capable of being polished, but is apt to break in the process. It is made into boxes, buttons, ear-drops, and other ornamental articles; and before the uses of the metals were well known, it was employed in different parts of the world for making arrow and spear heads, knives, etc. It is found in Iceland, the Lipari isles, Vesuvius, Sardinia, Hungary, Spain, Teneriffe, Mexico, South America, Madagascar, Siberia, etc. Black obsidian was used by the ancients for making mirrors, and for this purpose was brought to Rome from Ethiopia. It was used for the same purpose in Peru and Mexico. Mirrors of black obsidian are indeed still employed by artists. Chatoyant or avanturine obsidian is very beautiful when cut and polished, and ornaments made of it are sold at a comparatively high price.

OBSTETRICS. See MIDWIFERY, *ante*.

OBVERSE, or FACE, the side of a coin or medal which contains the principal device or inscription, the other side being in contradistinction called the reverse. See NUMISMATICS.

O'CALLAGHAN, EDMUND BAYLEY, LL.D., b. Ireland. After studying two years at Paris he went in 1823 to Quebec; commenced the practice of medicine in 1827; became in 1836 a prominent member of the provincial parliament; in 1834–37 was editor of the *Vindicator*, the national organ at Montreal. In 1837 he removed to New York. He has published several works, among which the following are the most important: ***History of***

New Netherlands; Jesuit Relations; *Documentary History of New York*, 4 vols.; *Documents relating to the Colonial History of New York*, 11 vols.; *Remonstrance of New Netherland; Commissary Wilson's Orderly Book; Orderly Book of General John Burgoyne; Journals of the Legislative Councils of New York*; *Voyage of George Clark to America*, with introduction and notes; *Voyages of the slavers St. John and Arms, Journal of the Voyage of the sloop Mary from Quebec;* and many translations of manuscripts from foreign languages.

OCCAM, William of, surnamed *Doctor Singularis et Invincibilis*, a famous schoolman, was born in England, at the village of Ockam, in the county of Surrey, about the year 1270. We do not possess any precise or satisfactory knowledge of his early life. He is said to have been educated at Merton college, Oxford, and to have held several benefices in his native country, but soon after resigned them on entering the Franciscan order. Early in the 14th c. it is supposed he proceeded to Paris, where he attended the lectures of Duns Scotus, of whose philosophy he was afterwards the most formidable opponent. Here he soon became prominent by the boldness of his ecclesiastical views. Philippe, *le Bel*, king of France, having forbidden pope Boniface VIII. to levy contributions in his dominions, the latter, by way of retaliation, excommunicated him. Occam rushed to the defense of the monarch, and in his *Disputatio inter Clericum et Militem, super Potestate Prælatis Ecclesiæ atque Principibus Terrarum Commissa*, denies that the popes have any authority in temporal affairs, and boldly declares that all who favored such a doctrine ought to be expelled from the church as heretics. Meanwhile, from being a listener, he had become a lecturer in philosophy. The system which he advocated—for he was not properly its originator—is known by the name of *nominalism* (q.v.), but it had never before received so rigorously logical and rational a treatment; hence his epithet of *Invincibilus*. The work in which his views are set forth is entitled *Expositio Aurea, et admodum utilis super totum Artem Veterem*. It contains a series of commentaries upon the *Isagoge* of Porphyry, and on the *Categories* and *Interpretation* of Aristotle, with a special treatise headed *Tractatus Communitatum Porphyrii*, and a theological opusculum on predestination. It is intended as a demolition of the moderns—i.e., the scholastics—and shows that in their method they have completely departed from the principles and methods of the great Stagyrite, for whom, like every sound and solid thinker, he shows the deepest respect and admiration. About 1820 or 1321 he again plunged into ecclesiastical controversy. A certain Narbonese priest, having affirmed that Jesus Christ and his apostles held everything in common, and that every ecclesiastical possession is a modern abuse, was pounced upon by the inquisitors, and defended by a certain Berenger Talon, a Franciscan monk of Perpignan. But Berenger's defense of apostolical poverty was naturally enough very disagreeable to the pope, John XXII., who therefore condemned it. Berenger was, however, vigorously supported by his order, and among others by Michael de Cesena, the general-superior, Bonagratia of Bergamo, and William of Occam, who attacked the pope with great vehemence and trenchant logic. Shortly after they were arrested as favorers of heresy, and imprisoned in Avignon. But while their trial was proceeding, Michael de Cesena and Occam, knowing what little mercy or justice they had to expect from their accusers and judges, made their escape to the Mediterranean, and were received at a little distance off shore on board a galley of Ludwig, king of Bavaria, the patron of the Franciscan antipope, Peter of Corbaras, and one of the most powerful sovereigns in Europe. The remainder of Occam's life was spent at Munich, where, safe from the machinations of his enemies, he continued to assail at once the errors of papistry in religion, and of realism in philosophy. He died April 7, 1847. It is impossible to praise Occam too highly. He was the first logician, and the most rational philosopher among the whole body of schoolmen. We are often reminded by his clear and vigorous common sense and wholesome incredulity that he was the countryman of Locke and Hobbes, and that he came of a people ever noted for the solidity of their understanding. Besides the works already mentioned, Occam's principal writings are: *Dialogus in tres Partes distinctus, quarum prima de Hæreticis, secunda de Erroribus Joannis XXII., tertia de Potestate Papæ, Conciliorum et Imperatoris; Opus Nonaginta Dierum contra Errores Joannis XXII.; Compendium Errorum Joannis Papæ XXII.; Decisiones Octo Quæstionum de Potestate summi Pontificis; Super Quatuor Libros Sententiarum Subtilissimæ Quæstiones earumque Decisiones* (based on Peter the Lombard's famous *Sententiæ*, and containing nearly the entire theology of Occam. These *Decisiones* were long almost as renowned as the *Sententiæ* which gave them birth); *Antiloquium Theologicum; Summa Logices ad Adamum Major Summa Logices.*—See Luke Wadding's *Scriptores Ordinis Minorum* (1650); Cousin's *Histoire de la Philosophie* (2d ed. 1840); and B. Hauréau's *De la Philosophie Scholastique* (1848).

OCCA'SIONALISM, or the doctrine of Occasional Causes (see Cause), is the name given to the philosophical system devised by Descartes and his school, for the purpose of explaining the action of mind upon matter, or, to speak more correctly, the combined, or at least the synchronous action of both. It is a palpable fact that certain actions or modifications of the body are accompanied by corresponding acts of mind, and *vice versâ*. This fact, although it presents no difficulty to the popular conception, according to which each is supposed to act directly upon the other—body upon mind, and mind upon body—has long furnished to philosophers a subject of much speculation. But on the other hand, it is difficult to conceive the possibility of any *direct* mutual interaction of substances so dissimilar, or rather so disparate. And more than one system has been devised for the explanation of the problem, as to the relations which subsist between the mind and the body, in reference to those operations, which are clearly attributable to them both. According to Descartes and the Occasionalists, the action of the mind is not, and cannot be *the cause* of the corresponding action of the body. But they hold that whenever any action of the mind takes place, God directly produces, in connection with it, and by reason of it, a corresponding action of the body; and in like manner conversely, they explain the coincident or synchronous actions of the body and the mind. It was in opposition to this view that Leibnitz, believing the Cartesian system to be open to nearly equal difficulties with that of the direct action, devised his system of *Pre-established Harmony*. See LEIBNITZ. His real objection to the Occasionalist hypothesis is, that it supposed a perpetual action of God upon creatures, and, in fact, is but a modification of the system of "direct assistance."

OCCULTATIONS (Lat. *occultatio*, a concealment) are neither more nor less than "eclipses;" but the latter term is confined by usage to the obscuration of the sun by the moon, and of the moon by the earth's shadow, while the former is restricted to the eclipses of stars or planets by the moon. Occultations are phenomena of frequent occurrence; they are confined to a belt of the heavens about 10° 17⅓' wide, situated parallel to, and on both sides of the equinoxial, and extending to equal distances n. and s. of it, being the belt within which the moon's orbit lies. These phenomena serve as data for the measurement of the moon's parallax; and they are also occasionally employed in the calculation of longitudes. As the moon moves in her orbit from w. to e., the occultation of a star is made at the moon's eastern limb, and the star emerges on the western limb. When a star is occulted by the dark limb of the moon (a phenomenon which can only occur between new moon and full moon), it appears to an observer as if it were suddenly extinguished, and this appearance is most deceptive when the moon is only a few days old. When an occultation occurs between full moon and new moon, the reappearance of the star at the outer edge of the dark limb produces an equally startling effect. "It has often been remarked," says Herschel, "that when a star is being occulted by the moon, it appears to advance actually *upon* and *within* the edge of the disk before it disappears, and that sometimes to a considerable depth." This phenomenon he considers to be an optical illusion, though he admits the possibility of its being caused by the existence of deep fissures in the moon's substance. Occultations of stars by planets and their satellites are of rarer occurrence than lunar occultations, and still more unfrequent are the occultations of one planet by another. Occultations are calculated in the same way as eclipses, but the calculation is simplified in the case of the fixed stars, on account of their having neither sensible motion, semi-diameter, nor parallax.

OCCUM, or OCCOM, SAMSON; an American Indian preacher; 1723–97; b. Conn.; converted at the age of 17, and soon expressed a desire to become the teacher of his tribe; educated for the ministry among his countrymen in a private school under the care of the rev. Eleazer Wheelock at Lebanon. This school gradually became a seminary for the education of Indians and of missionaries to the Indians, and was called Moor's charity school. It was opened as a missionary school in 1748, but not completely established until 1754. Here Brant, the famous Mohawk chief, was educated, having been sent there with others of his tribe through the influence of sir William Johnson, an active friend and patron of the school. After a four years' training in the school, Occum in 1748 taught a school in New London, but soon removed to Montauk, L. I., where he taught a school among the Indians for 10 years, being at the same time their religious teacher, and preaching to the Skenecock or Yenecock Indians, 30 m. distant. In a revival among the Montauks many became Christians. Occum was ordained by the Suffolk presbytery Aug. 29, 1759, and was a regular member of the presbytery from that time. In 1766 he accompanied the rev. Mr. Whitaker of Norwich to England and Scotland to solicit funds for the support and enlargement of the school. Great interest was excited, and the houses where he preached were thronged. While in England he preached between three and four hundred sermons. Donations were obtained amounting to £12,000, nearly all of which was invested in British funds, the income to be applied to the objects of the school. It was soon transferred to Hanover, N. H., and became Dartmouth college. After his return Occum preached to his countrymen in the region of New London, and sometimes was employed in missionary labors among distant Indians. In 1786 he removed to Brothertown, near Utica, N. Y., where was the home of the Stockbridge Indians, who were of the Mohegan root. Some of the Mohegans and other Indians of Connecticut, Long Island and Rhode Island accompanied Occum. They obtained a tract of land from the Oneidas. From this they removed to Michigan, and were merged in the Stockbridge tribe. Occum wrote an account of the Montauk Indians which he preserved in manuscript in the *Historical Collections*. He published a sermon at the execution of Moses Paul, an Indian, at New Haven.

OCCUPANCY, in law, the taking possession of an unappropriated corporeal thing, with the intention of becoming its owner. This mode of acquiring property came to the common from the Roman law, which considered occupancy a mode of acquiring property belonging to no one, but subject to appropriation by the first comer. Instances are uninhabited lands, which belong to the discoverer. The finder of unclaimed lost goods has a title to them by occupancy, and so has the captor of beasts of a wild nature, so long as he keeps possession of them, but there can be no complete property in them till they are domesticated; and if they make their escape, with no intention of coming back, *animus revertendi*, the ownership of the original owner ceases, and their next captor acquires a title in them by occupancy. But if they be once domesticated the title by occupation becomes indefeasible. The owner of property by accession acquires his title by occupancy, and so does the owner of goods obtained by confusion; it being held, that where a person with fraudulent intent mixes his property indistinguishably with that of another, the latter is not compelled to distinguish his property from that of the former, but is entitled to the ownership of the whole, and he acquires such ownership by occupancy. Blackstone refers the title to literary property to the same head of occupancy, and here also belongs the title to trade marks, ownership of which is acquired by a person using them to indicate his ownership of certain articles, or certain business. Another instance of title to personal property obtained by occupancy, occurs in the case of property acquired from an enemy in time of war. By the law of nations, property captured from an enemy vests in the government or sovereign of the state of which the captor is a subject; but the captors are generally allowed a part or the whole of the property captured. A good title to property captured on land is acquired by occupancy without the intervention of a court; but in the case of prizes acquired at sea, judgment must be rendered by a prize court of competent jurisdiction. The English method of distributing *booty*, i.e., property captured on land, is by grant from trustees appointed by the crown, and whose acts of distribution are subject to its assent. Instances of the acquisition of a title to land by occupancy are more rare. Land left bare by the sea or a lake, or deposited by a river, is acquired by occupancy. Another instance, at the common law, was where an estate was limited to one person during the life of another person, and the former died; there was then no person to whom the estate could pass. The executor could not take it, for it was not personal property; nor the heir, because it was not a fee; nor the original grantor, because he could not take back his own grant. Any person, therefore, could come in and take possession; and the person so acquiring possession was known as the "general occupant." The common law rule has been changed in many of the states, and in some the residue of the estate goes to the executor as personal property. Where the limitation was to one person and his heirs, during the life of another, and the former person dies, the residue goes to his heirs, not as heirs, because the estate is not one of inheritance, but as "special occupants" named in the grant. The general theory of title by occupation has long been of little importance. While this country was a colony of Great Britain, the ownership of land was held to be vested in the crown, and individual titles to land were derived from the crown. Since the separation of the colonies from Great Britain, titles are derived from the grant of the United States or the individual states. The *occupatio*, or occupation, of the Roman law, was the same thing as occupancy.

OCEAN, a term which, like SEA, in its general acceptation, denotes the body of salt water that separates continent from continent, and is the receptacle for the waters of rivers. The surface of the ocean is about three-fifths of the whole surface of the earth. Although no portion of it is completely detached from the rest, the intervening continents and islands mark it off into divisions, which geographers have distinguished by special names: the *Atlantic ocean* (q.v.). between America and Europe and Africa; the *Pacific ocean* (q.v.), between America and Asia; the *Indian ocean* (q.v.), lying s. of Asia, and limited on the e. and w. by Australasia and South Africa; the *Arctic ocean* (q.v.), surrounding the north pole; and the *Antarctic ocean* (q.v.), surrounding the south pole. The general features and characteristics of the ocean will be described under SEA.

OCEAN, a co. in s.e. New Jersey, bounded on the e. by the Atlantic ocean, watered by Cedar creek and Tom's river, traversed by the New Jersey Southern and Tuckerton railroads; about 650 sq.m.; pop, '80, 14,455—13,963 of American birth. The surface is level, and heavily wooded, and the soil sandy. The principal productions are corn, potatoes, cranberries, and lumber. Co. seat, Tom's River.

OCEA'NA, a co. in w. Michigan, bounded on the w. by lake Michigan; drained by White river; on the Chicago and West Michigan railroad; 550 sq.m.; pop. '80, 11,699—9,784 of American birth. The surface is rolling or level, and heavily wooded, and the soil fertile. The principal productions are corn, wheat, potatoes, and oats. Co. seat, Hart.

OCEAN'IA, the name given to the fifth division of the globe, comprising all the islands which intervene between the south-eastern shores of the continent of Asia and the western shores of the American continent. It naturally divides itself into three great sections—Malay Archipelego (q.v.), Australasia (q.v.), or Melanesia and Polynesia (q.v.).

OCEAN'ICA. (See OCEANIA, *ante.*)

OCEAN'US, in mythology, the eldest of the Titans, son of Ouranos and Gê, father, by his sister Tethys, of the 3,000 Oceanides, or ocean nymphs. He was the god of the ocean-stream which surrounded the plain of earth. His palace, according to Homer, was in the west. Æschylus represents him as living in a cave under ocean, from which he comes on a hippogriff to condole with Prometheus.

OCEL'LUS, LUCA'NUS, b. Lucania, Italy, 5th c. B.C.; a pupil of Pythagoras. He wrote a number of philosophical treatises, of which only one, *on the nature of the universe*, has been preserved. In this he maintains the eternity of the human race, and of the universe. Diogenes Laërtius cites a letter from Archytas to Plato, mentioning four treatises of Ocellus which the former had sent to Plato; the answer of Plato acknowledges the receipt of the books, of which he expresses a high opinion. The subjects of the four works were on *law*, *piety*, the nature of the *universe*, and *kingly rule*. The extant treatise is written in the Ionic dialect, while Doric was the dialect prevailing in Lucania. The genuineness of the work has been questioned on this ground. The weight of opinion seems to be in favor of the supposition of Rudolphi, that the work was originally written in Doric, but that the Ionic forms were introduced by successive copyists and grammarians. The fragments of the same treatise found in Stobæus, are written in Doric. There is an English translation by Thomas Taylor (1837).

OCELOT, the name of several species of *felidæ*, natives of the tropical parts of South America, allied to the leopard by flexibility of body, length of tail, and other characters, but of much smaller size. They are usually included in the genus *leopardus* by those who divide the felidæ into a number of genera. They are inhabitants of forests, and very expert in climbing trees. Their prey consists in great part of birds. They are beautifully marked and colored. The best-known species, or COMMON ocelot (*felis pardalis*), a native of the warm parts of America, from Mexico to Brazil, is from 2 ft. 9 in. to 4 ft. long, exclusive of the tail, which is from 11 to 15 ins., and nearly of uniform thickness. The ears are thin, short, and pointed. The muzzle is rather elongated. The colors vary considerably, but the ground tint is always a rich red or tawny color, blending finely with the dark brown on the margins of the open spots, of which there are chains along the sides; the head, neck, and legs being also variously spotted or barred with dark brown or black. The ocelot is easily tamed and is very gentle and playful, but excessively mischievous. It may be fed on porridge and milk, or other such food, and is said to be then more gentle than if permitted to indulge in carnivorous appetites. Very similar to the common ocelot are several other American species, as the LINKED OCELOT (*felis catenata*), the LONG-TAILED OCELOT (*felis macrourus*), the CHATI (*felis mitis*), etc. The similarity extends to habits and disposition as well as form.

O'CHERS, the name usually applied to clays colored with the oxides of iron in various proportions, giving to the clay a lighter or deeper color. Strictly speaking the term belongs only to a combination of peroxide of iron with water. From many mines large quantities of water charged with ferruginous mud are being continually pumped up, and from this water the colored mud or ocher settles In this way large quantities are procured from the tin mines of Cornwall, and the lead and copper mines of north Wales and the isle of Man. Ochers occur also ready formed, in beds several feet thick, in the various geological formations, and are occasionally worked, as at Shotover hill, Oxford, in Holland, and many other places in Europe and America. Very remarkable beds are worked in Canada. The ochers so obtained are either calcined for use or not, according to the tint wanted. The operation adds much to the depth of color, by increasing the degree of oxidation of the contained iron. The most remarkable varieties of ocher are the Siena earth (terra di Siena) from Italy; the so-called red chalk, with which sheep are marked; Dutch ocher; Armenian bole, or Lemnian earth; Italian rouge, and Bitry ocher. They vary in color from an Isabelline yellow, through almost every shade of brown, up to a tolerably good red. The finest kinds are used by painters, the coarsest by carpenters for marking out their work, by farmers for marking cattle, etc.

O'CHIL HILLS, a hilly range in Scotland, occupying parts of the counties of Perth, Clackmannan, Stirling, Kinross, and Fife, and extending from the vicinity of Stirling n.e. to the Firth of Tay. The range is 24 m. in length and about 12 m. in breadth. The highest summit is Bencleugh (2,352 ft.), near the s.w. extremity. The hills, which are formed chiefly of greenstone and basalt, contain silver, copper, and iron ores, and afford excellent pasturage.

OCHNA'CEÆ, a natural order of exogenous plants, containing not quite 100 known species, natives of tropical and subtropical countries. Some of them are trees, most of them under-shrubs; all are remarkable for their smoothness in all parts. Bitter and tonic qualities prevail in this order, and some species are medicinally used in their native countries. The seeds of *Gomphia jabotapita* yield an oil, which is used in salads in the West Indies and South America.

O'CHRO. See HIBISCUS.

OCKLEY, SIMON, 1678–1720; b. England; entered Queen's college, Cambridge, in 1693, and received the degree of B.D. In 1705 he was presented to the vicarage of Swavesey. He became learned in the oriental languages. From Arabic manuscripts in the Bodleian library, at Oxford, he compiled a work containing much serviceable information concerning the early conquests of the Arabs, entitled *The History of the Saracens*, beginning with the times immediately subsequent to the death of Mohammed, and concluding in the year 705, which is much esteemed as a book of reference for the student in oriental languages. Gibbon, the historian, while writing his *Decline and Fall*, consulted it with advantage, and characterized the author as "an original in every sense who had opened his eyes," and "a learned and spirited interpreter of Arabian authorities." Disraeli says: "He was, perhaps, the first who exhibited to us other heroes than those of Rome and Greece, sages as contemplative, and a people more magnificent even than the iron masters of the world." The scholars of his time received the book with marked approbation, esteeming it "the most authentic account of the Arabian prophet yet given to the world," and in 1847 it was regarded as "the standard history of this eventful period." In 1711 he was made professor of Arabic in the university of Cambridge, and in his inaugural address he pathetically referred to his poverty. The 1st vol. of his history was published in 1708, the 2d and last in 1718, and was dated at Cambridge castle, where he was imprisoned for debt. From these circumstances the conclusion is drawn that his literary work brought him little profit, but it is also a matter of history that he had an expensive family. In Chalmers's *Biographical Dictionary* there is an interesting account of his life, by Dr. Heathcote, and about the preparation of his principal work, his own words express the difficulties encountered, when he says: "Had I not been forced to snatch everything that I have, as it were, out of fire, our Saracen history should have been ushered into the world in a different manner." A third edition with additions by Dr. Long appeared in 1757 in 2 vols., and a fourth edition revised, improved, and enlarged, in 1847. Among his most important works, in addition to sermons on *The Christian Priesthood*, and the *Necessity of Instructing Children in the Scriptures*, there were published in 1706, *Introductio ad Linguis Orientalis in qua iis Discendis via munitur et Earum usus Ostenditur;* in 1707, *The History of the present Jews Throughout the World*, translated from the Italian of Leo of Modena, a Venetian rabbi; in 1708, *The Improvement of Human Reason Exhibited in the Life of Hai Ebn Yokdhan*, from the Arabic. In 1716 he published a new translation from the Arabic version of the second *Apocryphal Book of Esdras.* His writings are distinguished for their almost perfect accuracy as well as their erudition.

OCKMUL'GEE, a river in Georgia, which rises in the northern center of the state by three branches, and after a course of 200 m. s.s.e., joins the Oconee, to form the Altamaha. It is navigable to Macon, 130 m. above its mouth.

OCO'NEE, a river of Georgia, rises in the n.e. part of the state, and flows southerly 250 m. where it unites with the Ockmulgee to form the Altamaha; it is navigable to Milledgeville, 100 miles.

OCO'NEE, a co. in n.e. central Georgia, bounded by the Oconee river on the e., and the Appalachee on the w.; pop. '80, 6,349—of American birth, 6,344; colored, 3,032. The soil is fertile, and the surface hilly; corn and cotton are the chief products. The county was formed about 1870 from the s. part of Clarke county. Co. seat, Watkinsville.

OCO'NEE, a co. in extreme n.w. South Carolina, bounded n.w. by the Chatooga, s.w. by the Tugaloo, and e. by the Kiowee rivers; intersected by the Piedmont Air Line railroad; 750 sq.m.; pop. '80, 16,255—16,049 of American birth; colored, 4,301. The surface is broken and hilly, covered in most part by pine forests; cotton, Indian corn, and pork are the staples. Gold is found in small quantities. Co. seat, Walhalla.

O'CONNELL, DANIEL, eldest son of Mr. Morgan O'Connell of Darrynane, near Cahirciveen, in the co. of Kerry, Ireland, was born Aug. 9, 1775. His family was ancient, but straightened in circumstances. O'Connell received his first education from a hedge-schoolmaster, and, after a further training under a Catholic priest in the co. of Cork, was sent in 1790 to the English college at St. Omer. His school reputation was very high; but he was driven home prematurely by the outbreak of the revolution, and in 1794 entered as a law-student at Lincoln's inn. In 1798 he was called to the bar; and it was the boast of his later career as an advocate of the repeal of the Union with England, that his first public speech was delivered at a meeting in Dublin, convened for the purpose of protesting against that projected measure. He devoted himself assiduously, however, to the practice of his profession, in which he rose steadily. By degrees, the Roman Catholic party having begun to rally from the prostration into which they had been thrown through the rebellion of 1798 and its consequences, O'Connell was drawn into public political life. In all the meetings of his co-religionists for the prosecution of their claims, he took a part, and his unquestioned ability soon made him a leader. He was an active member of all the successive associations which, under the various names of "Catholic board," "Catholic committee," "Catholic association," etc., were organized for the purpose of procuring the repeal of the civil disabilities of the Catholic body. Of the Catholic association he was himself the originator; and although his supremacy in its councils was occasionally challenged by some aspiring associates, he continued all but supreme down to its final dissolution. By means of this association, and the "Catholic rent" which it was enabled to raise, he created so formidable an organization throughout Ireland that it gradually became apparent that the desired measure of relief could not longer be safely withheld; and the crisis was precipitated by the bold expedient adopted by O'Connell, of procuring himself to be elected member of parliament for Clare in 1828, notwithstanding his well-known legal incapacity to serve in parliament, in consequence of his being obliged to refuse the prescribed oaths of abjuration and supremacy, which then formed the ground of the exclusion of Roman Catholics from the legislature. This decisive step towards the settlement of the question, although it failed to procure for O'Connell admission to parliament, led to discussions within the House, and to agitations outside, so formidable, that in the beginning of the year 1829, the duke of Wellington and sir Robert Peel found it expedient to give way: and, deserting their former party, they introduced and carried through, in the spring of that year, the well-known measure of Catholic emancipation. O'Connell was at once re-elected, and took his seat for Clare, and from that date until his death continued to sit in parliament. He was elected for his native county in 1830, for the city of Dublin in 1836, for the town of Kilkenny in 1836 (having been unseated for Dublin on petition), for Dublin again in 1837, and for the co. of Cork in 1841. During all these years, having entirely relinquished his practice for the purpose of devoting himself to public affairs, he received, by means of an organized annual subsidy, a large yearly income from the voluntary contributions of the people, by whom he was idolized as their "liberator;" and who joined with him in all the successive agitations against the act of Union, against the Protestant church establishment, and in favor of reform, in which he engaged. In the progress of more than one of these political agitations, his associations were oppressed by the government; and the agitation for a repeal of the Union, recommenced in 1841 and carried on by "monster meetings" throughout Ireland, at which O'Connell himself was the chief speaker, assumed proportions so formidable, that he, in common with several others, was indicted for a seditious conspiracy, and after a long and memorable trial, was convicted, and sentenced to a year's imprisonment, with a fine of £2,000. This judgment was reversed by the House of lords; and O'Connell, on his discharge, resumed his career: but his health had suffered from confinement, and still more from dissensions and opposition in the councils of his party; and as, on the return of the whigs to power in 1846, he consented to support their government, the malcontents of the repeal association openly separated from him, and a bitter feud between "young" and "old" Ireland ensued. In this quarrel, O'Connell steadfastly maintained his favorite precept of "moral force," and was supported by the great body of the Catholic bishops and clergy; but his health gave way in the struggle. He was ordered to try a milder climate: and on his journey to Rome in the spring of 1847, he was suddenly seized with paralysis, and died at Genoa on May 15 of that year. His eminence as a public speaker, and especially as a master of popular eloquence, is universally admitted. Into the controversies as to his public and political character, it is not our place to enter here. His speeches unfortunately were for the most part extempore, and exist but in the reports (uncorrected by himself) taken at the time. He published but a single volume, *A Memoir of Ireland, Native and Saxon*, and a few pamphlets, the most important of which, as illustrating his personal history and character, is *A Letter to the Earl of Shrewsbury.*—See *Life and Times of Daniel O'Connell*, by his son, John O'Connell; also *Recollections of Daniel O'Connell*, by John O'Neill Daniel; Fagan's *Life of Daniel O'Oonnell;* and *The Liberator*, by L. F. Cusack (1872).

O'CONNOR, ARTHUR, 1763–1852; b. Ireland; called to the bar in 1788. Soon afterwards he entered the Irish parliament, where he advocated Roman Catholic emancipation; his course in this regard caused his uncle, lord Longueville, to disinherit him. Becoming one of the five directors of the "united Irishmen," he was tried for high treason, but acquitted. He then left Ireland for France, where he rose to be lieut.gen., and afterwards gen. of division. He wrote *Letters to the Earl of Carlisle*, 1795; *Letters to Earl Camden*, 1798; *The Present State of Great Britian*, 1804; and other works. He married a daughter of Condorset.

O'CONNOR, FEARGUS EDWARD, 1796–1855; b. in co. Meath, Ireland. In 1832 he was elected member of parliament for Cork, and when re-elected, in 1835, lost his seat on account of his disqualifications. He then became a prominent member of the so-called "chartist" party, and carried on the agitation for the extension of the ballot and other privileges to the lower classes. He was again returned to parliament in 1857 from Nottingham. Disheartened by the small success of his efforts he became insane in 1852.

O'CONNOR, RODERICK, (RORY), king of Ireland, 1116–98; b. Connaught; son of Turlogh O'Connor, king of Connaught, whom he succeeded in 1156. After a protracted contest with the O'Briens and O'Neals, he took the title of king of Ireland in 1166. He drove Dermot, king of Leinster, out of his kingdom in 1168, but afterwards reseated him on the throne. He worsted Strongbow and the English in a number of battles, but finally entered into a convention with them. In 1175 he had an interview with Henry II. of England, to whom he did homage, and whom he recognized as lord paramount of Ireland. Roderick kept the crown of Connaught till 1186, when, on account of a revolt of his sons, he entered a monastery, where he passed the rest of his life.

O'CONNOR, WILLIAM DOUGLAS, b. Mass., 1833; a journalist who commenced life as an art student in Boston, in 1853 became one of the editors of the *Commonwealth*, a newspaper published in that city. In 1854 he entered into an editorial connection with the *Saturday Evening Post* of Philadelphia, retaining it six years. He was twelve years corresponding clerk of the light-house board at Washington, and in 1873 became chief clerk, holding the position one year, and resigning it to accept that of librarian of the treasury department, of which the light-house board is a branch. He has contributed a number of essays, stories, and poems to the popular magazines; and in 1860, published *Harrington*, a romance; and in 1866, *The Good Grey Poet*, a pamphlet in favor of Walt

Whitman; and in 1867, *The Ghost*. His story of *The Carpenter*, which appeared in one of the periodicals, attracted much attention and critical comment.

OCONOMOWOC, a t. in Waukesha co., Wisconsin, on Oconomowoc creek, and the Chicago, Milwaukee, and St. Paul railroad; pop. '70, 2,080. There are a number of lakes in the vicinity, and it is a popular summer resort. It has three newspapers, a bank, a seminary for girls, and seven churches.

O'CONOR, CHARLES, LL.D.: b. New York city, 1804. His father came to this country from Ireland, and was a man of good family and liberal education. As he lost a considerable fortune shortly after his arrival here, he was unable to give his son a university education. At the age of 20, O'Conor was admitted to the bar of New York state. By his industry and high intellectual ability he soon gained high rank in the profession. Among the cases in which he has been concerned are many of national interest, such as that of the slave Jack, 1835. Other of his best known cases are the Lispenard, Parish, and Jumel will litigations, and the Forrest divorce suit. In politics, Mr. O'Conor is a democrat, but has rarely accepted office. He was district-attorney under president Pierce for a little over a year, has been member of several state conventions, and in 1872 was nominated for the presidency by the "labor reform" party, and by a convention of democrats dissatisfied by the nomination of Horace Greeley. He received in all but 29,489 votes, which were merely complimentary, as he had declined both nominations. He has always taken interest in the city government and local reform, and was one of the prosecuting counsel in the "ring" cases, as they were called, brought against the municipal officers of New York in 1873.

OCONTO, a co. in n.e. Wisconsin, bounded on the n.e. by Michigan and the Menomonee river, and on the s.e. by Green bay; watered by the Peshtigo and Oconto rivers, on the Chicago and Northern railroad; 5,000 sq.m.; pop. '80, 9,848—6,218 of American birth. The surface is heavily wooded with pine. The chief staples are wheat, potatoes, oats, and hay. Large quantities of lumber are exported. Co. seat, Oconto.

OCOSIN'GO, a t. in the state of Chiapas, Mexico; pop. 4,000. It is noted for the aboriginal monuments near it, of which an account has been given by Stephens in his *Incidents of Travel* in Central America.

OCTAGON, a plane closed figure of 8 sides. When the sides are equal, and also the angles, the figure is called a "regular octagon;" in this case, each angle is 135°, or equal to three half right angles. If the alternate corners of a regular octagon be joined, a square is constructed; and as the angle contained between the sides of the square and of the octagon is one-fourth of a right angle, the octagon may easily be constructed from the square as a basis.

OCTAHEDRON (Gr. *okto*, eight, *hedra*, base) is a solid figure bounded by 8 triangles, and having 12 edges and 6 angles. A *regular* octahedron has its 8 triangular faces all equilateral, and may, for convenience, be defined as a figure composed of two equal and similar square pyramids with equilateral triangles for their sides placed base to base. This solid is symmetrical round any angle, and is one of Plato's 5 regular solids. The octahedron appears in nature as one of the forms of crystals of sulphur.

OCTAVE (Lat. *octavus*, eighth), the interval between any musical note and its most perfect concord, which is double its pitch, and occupies the position of the eighth note from it on the diatonic scale. The name octave is often given to the eighth note itself as well as to the interval. There is between a note and its octave a far closer relation than between any other two notes; they go together almost as one musical sound. In combination, they are hardly distinguishable from one another, and their harmonics agree invariably, a coincidence which occurs in the case of no other interval.

OCTA'VIA, the sister of the Roman emperor Augustus, and wife of Mark Antony. She was distinguished for her beauty, her noble disposition, and womanly virtues. Her first husband was C. Marcellus, to whom she was married 50 B.C. He died 41 B.C., shortly after which she consented to marry Antony, to make secure the reconciliation between him and her brother. The event was hailed with joy by all classes. In a few years Antony became tired of his gentle and virtuous spouse, and forsook her for Cleopatra. When the Parthian war broke out, Octavia wanted to accompany her husband, and actually went as far as Corcyra, whence Antony sent her home, that she might not interrupt his guilty intercourse with the Egyptian queen. In 35 B.C., Octavia made an effort to rescue him from a degradation that was indifferent even to the honor of the Roman arms, and sailed from Italy with re-enforcements; but a message reached her at Athens ordering her to return home. She proudly obeyed, but, with a magnanimity that reminds us of the Roman character in earlier and better days, she forwarded the supports to her husband. Her brother, Octavian, was indignant at the treatment she received, and would have had her quit her husband's house, and come and live with him; but she refused. In 32 B.C. war, long inevitable, broke out between Antony and Octavia; and the former crowned his insults by sending Octavia a bill of divorcement. But no injury was too great to be forgiven by this "patient Grizel" of the ancient world; and after her husband's death, she brought up with maternal care not only her own children, but also Cleopatra's bastards. Her death took place 11 B.C.

OCTOBER (Lat. *octo*, eight) was the eighth month of the so-called "year of Romulus," but became the tenth when (according to tradition) Numa changed the commencement of the year to the first of January, though it retained its original name. It has since maintained its position as the tenth month of the year, and has 31 days. October preserved its ancient name notwithstanding the attempts made by the Roman senate, and the emperors Commodus and Domitian, who substituted for a time the terms Faustinus, Invictus, Domitianus. Many Roman and Greek festivals fell to be celebrated in this month, the most remarkable of which was the sacrifice at Rome of a horse (which was called *October*) to the god Mars. The other festivals were chiefly bacchanalian. Among the Saxons it was styled *Wyn moneth* or the wine month.

OCTO'PODA (Gr. eight-footed), a section of dibranchiate cephalopods (see Cephalopoda), having the body in general very short, the head very distinct; eight arms, not very unequal, furnished with simple suckers; with or without a shelly covering. To this section belong argonauts, poulpes, etc.

OCTO'PUS. See Poulpe.

OCTOSTYLE, the name given in classic architecture to a portico composed of eight columns in front.

OCTROI (Lat. *auctoritas*, authority), a term which originally meant an ordinance authorized by the sovereign, and thence came to be restrictively applied to a toll or tax in kind levied from a very early period in France, and other countries of northern Europe, on articles of food which passed the barrier or entrance of a town. The right to levy this toll was often delegated to subjects, and, in order to increase its amount, a device was resorted to of raising the weight of the pound in which the octroi was taken. The large pound, an ounce heavier than that in ordinary use, was called the *livre d'octroi*, whence the expression *pound troy*. The octroi came eventually to be levied in money, and was abolished in France at the revolution. In 1798 it was re-established, under the pretext that it was required for purposes of charity, and called the *octroi de bienfaisance*, and it has been reorganized in 1816, 1842, and 1852. Of the octroi duty which is at present levied at the gates of the French towns, one-tenth goes to the national treasury, and the rest to local expenses. The octroi officers are entitled to search all carriages and individuals entering the gates of a town. From the octrois of Paris government derived, a few years ago, a revenue of 56 million francs. In 1860 the Belgian government acquired popularity by abolishing the octroi.

The epithet *octroyé* is applied by continental politicians to a constitution granted by a prince, in contradistinction to one which is the result of a paction between the sovereign and the representatives of the people. Any public company possessing an authorized monopoly like that held by the East India company is said to be *octroyé*.

O'CURRY, Eugene, 1796–1862; b. Ireland; appointed in 1834 an assistant in the ordnance survey of Ireland. In 1841 he began to catalogue and copy the Gaelic MSS. of Trinity college, Dublin, and the Royal Irish academy, and assisted in the preparation of the Irish archæological society's publications. In 1853 he was associated with Dr. O'Donovan in the translation of the ancient Brehon laws. In 1854 he became professor of Irish history and archæology in the new Roman Catholic university in Dublin. He published a translation of the *Battle of the Magh Leana, together with the Courtship of Mornera* (1855), and *Lectures on the Manuscript Materials of Ancient Irish History* (1861).

OD (from the same root as Odin, and supposed to mean all-pervading), the name given by baron Reichenbach (q.v.) to a peculiar physical force which he thought he had discovered. This force, according to him, pervades all nature, and manifests itself as a flickering flame or luminous appearance at poles of magnets, at the poles of crystals, and wherever chemical action is going on. This would account for the luminous figures said to be sometimes seen over recent graves. The odd force has positive and negative poles, like magnetism. The human body is od-positive on the left side, and od-negative on the right. Certain persons, called "sensitives," can see the odic radiation like a luminous vapor in the dark, and can feel it by the touch like a breath. As the meeting of like odic poles causes a disagreeable sensation, while the pairing of unlike poles causes a pleasant sensation, we have thus a sufficient cause for those likings and antipathies hitherto held unaccountable. Some sensitive persons cannot sleep on their left side (in the northern hemisphere), because the north pole of the earth, which is od-negative, affects unpleasantly the od-negative left side. All motion generates od; why, then, may not a stream running underground affect a sensitive water-finder, so that the divining-rod in his or her hand shall move without, it may be, any conscious effort of will? All the phenomena of mesmerism are ascribed to the workings of this od-force. Reichenbach does not pretend to have had the evidence of his own senses for any of those manifestations of his assumed od-force; the whole theory rests on the revelations made to him by "sensitives." It may be added, that few, if any, really scientific men have any belief in the existence of such a force.—Those curious in such matters are referred for the details of the subject to Reichenbach's large work, translated into English by Dr. Ashburner, under the title of *The Dynamics of Magnetism*, or to a briefer account in his *Odisch-Magnetische Briefe* (Stutt. 1852).

ODAL or **UDAL RIGHT** (Celtic *od*, property), a tenure of land which was absolute, and not dependent on a superior, and prevailed throughout northern Europe before the rise of feudalism. It was founded on the tie of blood which connected freeman with freeman, and not on the tie of service. It was the policy of the sovereign authority everywhere to make it advantageous for the freemen to exchange the odal tie for the tie of service—a change which paved the way for the feudal system. The odalers of Orkney were allowed to retain or resume their ancient privileges, on paying a large contribution to the erection of St. Magnus's cathedral at Kirkwall; and the odal tenure prevails to this day to a large extent in the Orkney and Shetland islands, the right to land being completed without writing by undisturbed possession proved by witnesses before an inquest.

ODD-FELLOWS, the name assumed by one of the most extensive self-governed provident associations in the world. The institution was originated in Manchester in 1812, although isolated "lodges" had existed in various parts of the country for some time previously. These latter were generally secret fraternities, humble imitations of Freemasonry—adopting a similar system of initiatory rites, phraseology, and organization—instituted for social and convivial purposes, and only occasionally extending charitable assistance to members. On its institution in Manchester, the main purpose of oddfellowship was declared by its laws to be, "to render assistance to every brother who may apply through sickness, distress, or otherwise, if he be well attached to the queen and government, and faithful to the order;" and this continues to be the basis of all its operations. It still, however, retains some of the characteristics of freemasonry, in possessing pass-words and peculiar "grips," whereby members can recognize one another. The headquarters of the society are at Manchester, where the grand-master and board of directors meet quarterly to hear appeals, and transact the general business of the order. In Jan., 1852, the total number of members was 224,441; in Jan., 1878, the number was 526,802. The lodges number 4,121, spread over 456 districts; the annual income being about £520,000, with considerably less expenditure. Should any lodge fail to meet its legitimate obligations, the district becomes liable; failing the district, the responsibility falls upon the entire unity. The order is widely spread over the whole of England and Scotland. It exists independently in America (where there are near 420,000 members of the separated association), Australia, New Zealand, and the West Indies; but there are "lodges" in Philadelphia, New York, in all the British colonies, and one in Constantinople (originated in 1862), which are affiliated to and in connection with the Manchester board. These widespread ramifications of this society enable emigrant members to be at once received into fellowship in those countries. In the American states, oddfellowship is said to exercise considerable political influence. A quarterly periodical, called the *Odd-fellows' Magazine*, devoted to its interests, is published in Manchester. In an early number of this publication, an odd-fellow is described as "like a fox for cunning, a dove for tameness, a lamb for innocence, a lion for boldness, a bee for industry, and a sheep for usefulness."

ODD-FELLOWS, INDEPENDENT ORDER OF. The order was introduced into the United States in 1806. Some persons who had been members of English lodges established a lodge at Baltimore in 1819; and this lodge soon received a charter from the Manchester unity. The lodges already established in New York, Philadelphia, and Boston accepted charters from the Maryland grand lodge. The American lodges have long ceased to hold friendly relations with the Manchester unity. The U. S. grand lodge has established grand lodges in all the states and in most of the territories. About 20 periodicals, devoted to the order, are published in this country. American odd-fellowship seeks "to visit the sick, relieve the distressed, bury the dead, and educate the orphan." There are now (1881) about 475,000 members of the organization in the United States, and the annual disbursements for relief of families, burials, education, etc., are over $1,500,000. To become a member of a U. S. lodge a person must be a white male, at least 21 years of age, and must believe in a supreme being.

ODE (Gr. a song) originally meant any lyrical piece adapted to be sung. In the modern use of the word, odes are distinguished from songs by not being necessarily in a form to be sung, and by embodying loftier conceptions and more intense and passionate emotions. The language of the ode is therefore abrupt, concise, and energetic; and the highest art of the poet is called into requisition in adapting the meters and cadences to the varying thoughts and emotions. Hence the changes of meter and versification that occur in many odes. The rapt state of inspiration that gives birth to the ode, leads the poet to conceive all nature as animated and conscious, and instead of speaking *about* persons and objects, to address them as present.

Among the highest examples of the ode are the *Song of Moses* and several of the psalms. Dryden's *Alexander's Feast* is reckoned one of the first odes in the English language. We may mention, as additional specimens, Gray's *Bard*, Collin's *Ode to the Passions*, Burns's *Scots wha ha'e*, Coleridge's *Ode to the Departing Year* and *Dejection*, Shelley's *Ode to the Skylark*, and Wordsworth's *Ode on the Recollections of Immortality in Childhood*.

ODENHEIMER, WILLIAM HENRY, D.D., 1817-80; b. Philadelphia; educated at the university of Pennsylvania. He took orders in the Protestant Episcopal church, became rector of St. Peter's church, Philadelphia, in 1840, and was elected bishop of New Jersey in 1859. He published *The Origin of the Prayer-Book* (1841), an essay on *Canon Law*, (1847), *Jerusalem and Vicinity* (1855), and other works.

O'DENKIRCHEN, a t. of Rhenish Prussia, 15 m. w.s.w. from Düsseldorf, near the right bank of the Niers. It has manufactures of velvets, paper, leather, etc., and like many of the other manufacturing towns in the same district, has recently much increased in size and population. Pop. '75, 7,848.

O'DENSEE, anciently known as Odin's-Ey or Odin's Oe (i.e., Odin's island), the chief town of the Danish island of Fünen, and the oldest city of the kingdom, is situated in the amt or district of the same name, in 55° 25' n. lat., and 10° 20' e. long. Pop. '70, 16,970. Odensee, which is the seat of the governor of the island and the see of a bishop, has a gymnasium, several literary societies, and is an active, thriving provincial town. A bishopric was founded here in 988, prior to which time Odensee bore the reputation of being the first city established by Odin and his followers. The cathedral, founded in 1086 by St. Knud, whose remains, like those of several of the early Danish kings, were deposited here, is a fine specimen of the early simple Gothic style. The lay convent or college for ladies contains an extensive library, furnished with copies of all printed Danish works. At Odensee a diet was held in 1527, in which the reformed or Lutheran doctrines were declared to be the established creed of Denmark, and equality of rights was granted to Protestants; while another diet held there in 1539 promulgated the laws regulating the affairs of the reformed church.

O'DENWALD. See HESSE-DARMSTADT.

ODE'ON, a musical theater among the ancient Greeks, built on the same plan as the theater, but smaller, and covered with a roof. The first was at Sparta, about the middle of the 7th c. B.C. It was called the Skias, and was designed by Theodorus, an architect of Samos. Athens had an old one near the Ilissus, but Pericles erected a better one. It stood near the base of the acropolis, on the s.e. side, and its form was said to be imitated from that of Xerxes' tent. It was burned at the siege of Athens by Sulla, and soon after re-erected by Ariobarzanes, king of Cappadocia. There were two other odeons in Athens, one of which, built by Herodes Atticus, had a capacity of 8,000. Each principal Greek city had its odeon; and it was introduced into Rome by Domitian.

O'DER (Lat. *Viadrus*, Slavon: *Vjodr*), one of the principal rivers of Germany, rises in the Leselberg on the table-land of Moravia, more than 1000 ft. above the level of the sea, and enters Prussian Silesia at Odersberg, after a course of some 50 miles. After traversing Brandenburg in a n.w. direction, it crosses Pomerania, and empties itself into the Stettiner Haff, from whence it passes into the Baltic by the triple arms of the Dievenow, Peene, and Swine, which inclose the islands of Wollin and Usedom. The Oder has a course of more than 500 m., and a river-basin of 50,000 sq.miles. The rapid flow of this river, induced by its very considerable fall, is accelerated by the affluence of several important mountain-streams, and thus contributes, together with the silting at the embouchures of these streams, to render the navigation difficult; great expense and labor being, moreover, necessary to keep the embankments in order, and prevent the overflowing of the river. The Oder has numerous secondary streams, the most important of which are the Oppa, Neisse, Ohlau, Klodnitz, Bartsch, Warte, and the Ihna: and is connected with the Havel and thence with the Elbe by the Finow canal, and with the Spree by the Friedrich-Wilhelms canal. The chief trading port of the Oder is Swinemunde, which constitutes an important center for the transfer of colonial and other foreign goods to northern Germany and Poland. At Ratibor, 17 m. below Oderberg, the river becomes navigable, and is upwards of 100 ft. in breadth; at Oppeln, in Prussian Silesia, it has a breadth of 238 feet. As a boundary river, it is of considerable importance in a military point of view, and is well defended by the fortresses of Kosel, Grossglogau, Küstrin, and Stettin.

ODERZO, a t. in the Italian province of Treviso, 14 m. n.e. of the town of Treviso; pop. about 6,500. In ancient times the place was called *Opitergium*, and it is stated that in the wars of Cæsar and Pompey, 1000 young men from this town slew themselves in preference to remaining the prisoners of Pompey. It was formerly much larger than at present, but still has some business activity. Its chief interest is from its numerous palaces, pictures, and antiquities. The villa *Colfrancui* contains many inscriptions, bas-reliefs, and bronze, iron, ivory, and gold objects of art, found near by.

ODESSA, an important seaport and commercial city of s. Russia, in the government of Kherson, stands on an acclivity sloping to the shore, on the n.w. coast of the Black sea, 32 m. n.e. of the mouth of the Dniester. Lat. 46° 29' n., long. 30° 44' east. The harbor is formed by two large moles defended by strong works, and is capable of containing 200 vessels. The bay is deep enough even close in shore to admit the approach of the largest men-of-war, and is frozen only in the severest winters, and then only for a short time. The promenade along the face of the cliff, descending to the shore by a broad stone stair of 204 steps, is the favorite walk of the inhabitants. Here also stands the monument of the duc de Richelieu, to whom in great part the town is indebted for its prosperity. In the pedestal of the monument is preserved the ball by which he was shot during the bombardment of the town by the allied fleet in 1854. The university of

Odessa, founded in 1865, had, in 1877, 43 professors and 252 students; and the library possessed over 150,000 volumes. The city contains many fine edifices, as the cathedral of St. Nicholas, the admiralty, the custom-house, etc. Owing to the intensity of the heat in summer (rising occasionally to 120°), and the dryness of the soil, vegetation in the vicinity of Odessa is very poor. In the neighborhood are quarries of soft stone, which is used for building purposes in Odessa and in the surrounding towns. One of the great deficiencies of Odessa used to be its want of good water; but works for securing an ample supply from the Dniester were completed in 1873. Gas was first used in Odessa in 1861; and the theater, the hotels, and all the larger houses now use the handiest of the artificial lights. A railway, opened in 1872, has added enormously to the commercial success and importance of Odessa, as it connects it, and of course Kherson, with the governments n. and e. of it in Russia. The estimated value of the various quantities of grain, wool, hides, tallow, and other articles of export for the year 1871 was £7,110,000, of which amount, the value of goods shipped in British vessels was £2,372,000. In 1876 the total exports were valued at about £7,790,000, and the imports at £7,350,000. The rapid strides Odessa has made in commerce within the last few years will be seen when these latter sums are compared with the corresponding ones of 1858 and 1869; the former year showing the sum of £670,000, and the latter exhibiting a fall down to £465,000. The pop. of Odessa in 1873 was 184,819.

In ancient times, Odessa (Gr. *Odessus*) was inhabited by a Greek colony, and later by Tartar tribes. In the beginning of the 15th c., the Turks constructed a fortress here, which was taken by the Russians in 1789. In 1793 a Russian fortress was built here, and became the nucleus of a town and port, which two years after received the name of Odessa. The duc de Richelieu, a French emigrant in the Russian service, was appointed governor here in 1803, and during the 11 years of his wise administration the town prospered rapidly. Since 1823 the city has formed part of the general governorship of s. Russia; is the seat of its administration, and is the residence of the gov.gen. and of an archbishop. The advantageous commercial position of the city, and the privileges granted to it by government, but chiefly the privileges of a free port between 1817 and 1858 (in place of which it now receives an annual subsidy) have developed this city from a mere Turkish fortress into the chief commercial town of the Russian empire after St. Petersburg and Riga. On the outbreak of the Crimean war, April 1854, the British steamer *Furious* went to Odessa for the purpose of bringing away the British consul. While under a flag of truce, she was fired upon by the batteries of the city. On the failure of a written message from the admirals in command of the fleet to obtain explanations, 12 war-steamers invested Odessa, April 22, and in a few hours destroyed the fortifications, and took a number of Russian vessels.

ODIC FORCE. See OD, *ante*.

ODEYPOOR', OODYPORE, or UDAIPUR, the name of several territories in India.—1. The principal is a Rajpoot state, also called Meywar; area about 11,600 sq.m., and pop. '71, 1,160,000.—2. A tributary state in Chota Nagpore, with an area of 1051 sq.m.; pop. 27,708.—3. Chota Odeypoor is a tributary state in Gujerat; area 650 m.; pop. 62,913.

O'DIN, the chief god of northern mythology. According to the sagas, Odin and his brothers, Vile and Ve, the sons of *Boer*, or the first-born, slew Ymer or Chaos, and from his body created the world, converting his flesh into dry land; his blood, which at first occasioned a flood, into the sea; his bones into mountains; his skull into the vault of heaven; and his brows into the spot known as *Midgaard*, the middle part of the earth, intended for the habitation of the sons of men. Odin, as the highest of the gods, the *Alfader*, rules heaven and earth, and is omniscient. As ruler of heaven, his seat is Valaskjalf, from whence his two black ravens, Huginn (Thought) and Muninn (Memory), fly daily forth to gather tidings of all that is being done throughout the world. As god of war, he holds his court in Valhalla, whither come all brave warriors after death to revel in the tumultuous joys in which they took most pleasure while on earth. His greatest treasures are his eight-footed steed Sleipner, his spear Gungner, and his ring Draupner. As the concentration and source of all greatness, excellence, and activity, Odin bears numerous different names. By drinking from Mimir's fountain he became the wisest of gods and men, but he purchased the distinction at the cost of one eye. He is the greatest of sorcerers, and imparts a knowledge of his wondrous arts to his favorites. Frigga is his queen, and the mother of Baldur, the Scandinavian Apollo; but he has other wives and favorites, and a numerous progeny of sons and daughters. Although the worship of Odin extended over all the Scandinavian lands, it found its most zealous followers in Denmark, where he still rides abroad as the wild huntsman, rushing over land and water in the storm-beaten skies of winter.

The historical interpretation of this myth, as given by Snorre Sturleson, the compiler of the *Heimskringla*, or chronicles of the kings of Norway prior to the introduction of Christianity, and followed in recent times by the historian Suhm, is that Odin was a chief of the Œsir, a Scythian tribe, who, fleeing before the ruthless aggressions of the Romans, passed through Germany to Scandinavia, where, by their noble appearance, superior prowess, and higher intelligence, they easily vanquished the inferior races of those lands, and persuaded them that they were of godlike origin. According to one tradition, Odin conquered the country of the Saxons on his way; and leaving one of his sons to rule there, and introduce a new religion, in which he, as the chief god Wuotan, received divine honors, advanced on his victorious course, and making himself master of Denmark, placed another son, Skjold, to reign over the land, from whom descended the royal dynasty of the Skjoldingar. He next entered Sweden, where the king, Gylfi, accepted his new religion, and with the whole nation worshipped him as a divinity, and received his son Yugni as their supreme lord and high-priest, from whom descended the royal race of the Yuglingars, who long reigned in Sweden. In like manner he founded, through his son Sœming, a new dynasty in Norway; and besides these, many sovereign families of northern Germany, including our own Saxon princes, traced their descent to Odin. As it has been found impossible to refer to one individual all the mythical and historical elements which group themselves around the name of Odin., Wodin, or Wuotan, it has been suggested by Suhm and other historians, that there may have been two or three ancient northern heroes of the name; but notwithstanding the conjectures which have been advanced since the very dawn of the historical period in the n. in regard to the origin and native country of the assumed Odin, or even the time at which he lived, all that relates to him is shrouded in complete obscurity. It is much more probable, however, that the myth of Odin originated in nature-worship. See SCANDINAVIAN MYTHOLOGY.

ODLING, WILLIAM, b. England, 1829; studied medicine in Guy's hospital, and at the university of London. In 1863 he became professor of chemistry at St. Bartholomew's hospital. In 1861 he published a *Manual of Chemistry*, and in 1866 *Lectures on Animal Chemistry*. In 1868 he succeeded Faraday as Fullerian professor at the royal institution, and in 1872 became professor of chemistry at Oxford.

ODO, SAINT, 879-943, second abbot of Clugny, son of Abbon, a powerful lord at the court of William the strong, duke of Aquitaine, solemnly consecrated by his father to the church even before his birth. His education, commenced in the convent of St. Martin of Tours under the guidance of saint Odalric, was completed at Paris. He returned to St. Martin, but, thinking that its rule was not strict enough, left it and entered the Cistercian convent at Baume, in Burgundy. After the death of Bernon, Odo was chosen to succeed him as abbot of Clugny and of Bourgdeols. Under his energetic administration the order rapidly increased in reputation and wealth. The fame of the school of Clugny was diffused far and wide. The aid of Odo was sought in reforming converts in various quarters. The popes sent for him to settle disputes between princes and kings, intrusted him with the most important diplomatic negotiations. On his return from a journey to Rome he died in the convent of St. Julian at Tours. He was profoundly conscious of the corruption in the church among the clergy, monks, and laity; and while full of zeal for the renovation of the Christian life, did not regard asceticism as Christian perfection, though he sought to correct the secularized life of the clergy by a severe monastic discipline. In the midst of prevailing corruption his pious zeal and pure life gave him great influence and authority. He was a diligent writer, and composed many anthems and hymns.

ODOA'CER (also ODOVACER, ODOBAGAR, ODOVACHAR, OTACHAR, etc., and, according to St. Martin, the same as OTTOCHAR, a name frequent in Germany during the middle ages), the ruler of Italy from the year 476 to 493, was the son of Edecon, a secretary of Attila, and one of his ambassadors to the court of Constantinople. This Edecon was also capt. of the Scyrri, who formed the bodyguard of the king of the Huns. After the death of Attila he remained faithful to the family of his master, but perished about 463 in an unequal struggle with the Ostrogoths. He left two sons, Onulf and Odoacer, the former of whom went to seek his fortune in the east; while Odoacer, after leading for some time the life of a bandit chief among the Noric Alps, determined to proceed to Italy, whither barbarian adventurers were flocking from all Europe. According to a monkish legend, a pious hermit, St. Severinus, whom he went to visit before his departure, prophesied his future greatness. Odoacer entered the military service of the western Roman empire, and rapidly rose to eminence. He took part in the revolution by which Orestes (475) drove the emperor Julius Nepos from the throne, and conferred on his son Romulus the title of Augustus, which the people scoffingly changed into Augustulus. He soon perceived the weakness of the new ruler, and resolved to profit by it. He had little difficulty in persuading the barbarian soldiery, who had effected the revolution, that Italy belonged to them, and in their name demanded of Orestes the third part of the land as the reward of their help. This Orestes refused; and Odoacer, at the head of his Herulians, Rugians, Turcilingians, and Scyrii, marched against Pavia, which Orestes had garrisoned, stormed the city, and put his opponent to death (476). Romulus abdicated, and withdrew into obscurity. What became of him is not known. Thus perished the Roman empire. Odoacer showed himself to be a wise, moderate, and politic ruler, quite unlike our general notion of a barbarian. In order not to offend the Byzantine emperor Zeno, he took the title of king only, and caused the senate to despatch to Constantinople a flattering letter, in which it declared one emperor to be enough for both east and west; renounced its right of appointing the emperors, expressed its confidence in the civil and military talents of Odoacer, and begged Zeno to confer upon him the administration of Italy. After some hesitation the Byzantine emperor yielded to the entreaties of the senate, and Odoacer received the title of *Patricius*. He fixed his residence at Ravenna. According to his promise he divided among his companions the third part of the land of Italy—a measure far less unjust than at first sight may seem, for the peninsula was then almost depopulated, and many domains were lying waste and ownerless. This barbarian ruler did everything in his power to lift Italy out of the deplorable condition into which she had sunk, and to breathe fresh life into her municipal institutions—those venerable relics of nobler days! He even re-established the consulate, which was held by eleven of the most illustrious senators in succession, maintained peace throughout the peninsula, overawed the Gauls and Germans, and reconquered Dalmatia and Noricum. In religion, though an Arian himself, he acted with a kingly impartiality that more orthodox monarchs have rarely exhibited. Gibbon remarks, with his usual pointed sarcasm, that the *silence* of the Catholics attests the toleration which they enjoyed. The valor, wisdom, and success of Odoacer appear to have excited the jealousy and alarm of Zeno, who encouraged Theodoric, king of the Ostrogoths, a still greater warrior and sovereign than Odoacer himself, to undertake an expedition against Italy. The first battle was fought on the banks of the Isontius (mod. *Isonzo*), Aug. 28, 489. Odoacer was beaten, and retreated. During his retreat he hazarded another battle at Verona, and was again beaten. He now hastened to Rome to rouse the inhabitants, but the gates of the city were closed against him. Returning northwards to his capital; Ravenna, he reassembled the wrecks of his army, and in 490 once more marched against the Ostrogoths, whose advance guard he defeated and pursued to the walls of Pavia. Another great battle now took place on the banks of the Adda, when Odoacer was vanquished for the third time. He now shut himself up in Ravenna, where Theodoric besieged him for three years. Odoacer then capitulated, on condition that the kingdom of Italy should be shared between him and Theodoric. This agreement was solemnly sworn to by both parties, Feb. 27, 493; but on March 5 Odoacer was assassinated at a feast, either by Theodoric himself or by his command.

ODOM'ETER (Gr. *odos*, a road, *mĕtrŏn*, a measure), also called *perambulator*, or *surveying-wheel*, is an instrument attached to a carriage or other vehicle, for the purpose of registering the distance it has traveled. Such machines have been in use from an early period, and one is described by Vitruvius in that part of his work, *De Architectura*, which is devoted to machines. The instrument, as commonly employed, consists of a train of wheel-work, which communicates motion from the axle of the carriage wheel to an index which moves round the circumference of a dial fixed in one side of the carriage over the axle. The wheel-work is arranged so as to produce a great diminution of the velocity impressed by the axle of the vehicle, and the dial is so graduated that the index can show the number of miles, furlongs, yards, etc., traversed. The instrument is also constructed to work independently, being in this case provided with wheels and an axle of its own; when this is done the wheel is made of such a size that its circumference is an aliquot part of a mile, an arrangement which greatly simplifies the calculation of the distance traversed. The complete odometer can then be drawn along by a man on foot, or attached behind a carriage. See PEDOMETER.

O'DONNELL, LEOPOLD, Duke of Tetuan, Marshal of Spain, b. in 1809, was descended from an ancient Irish family. He entered the Spanish army when young, and bravely espoused the cause of the infant queen Isabella against her uncle, Don Carlos. When the Carlists were overthrown, he was created count of Lucena, made gen. of brigade, and chief of the staff to Espartero. He took the side of the queen-mother in 1840, emigrated with her to France at the time when her cause seemed desperate, and took up his residence at Orleans, where he planned many of the political risings and disturbances which took place under the rule of Espartero. He headed in person a revolt of the Navarrese against the minister, but on its failure returned to France. In 1843 his intrigues against Espartero (q.v.) were successful, and he was rewarded by the governor-generalship of Cuba, where he amassed a large fortune by favoring the iniquitous trade in slaves. When he returned to Spain (1845) he intrigued against Bravo Murillo and Narvaez; and when the latter was succeeded by Sartorius, O'Donnell, proscribed by the government, headed a military insurrection. Defeated and driven into Andalusia in 1854, he issued a liberal manifesto. The profligacy of the court and the despotism of the government favored the appeal; and when Espartero gave in his adhesion, the Spaniards rose *en masse* and replaced the ex-regent at the helm. Espartero reversed the confiscation against O'Donnell, and made him a marshal and minister of war. O'Donnell again plotted against his old benefactor, and in July, 1856, supplanted him by a *coup d'etat*. Blood was shed in the streets of Madrid, but O'Donnell remained president of the council. He was in three months' time succeeded by Narvaez; but in 1858 he returned to power again, and in 1859, while still holding the position of prime minister, he assumed the command of the army sent to Morocco. The campaign continued for many months, without leading either to reverses or glory. The Moors displayed an entire absence of military qualities; and O'Donnell, though successful in obscure skirmishes, occupied three months in the march from Ceuta to Tetuan. A battle took place, Feb. 4, 1860; O'Donnell gained a complete victory, took the Moorish camp, and the city of Tetuan surrendered to the Spaniards. The emperor of Morocco submitted to a loss of territory, and O'Donnell was raised to the first rank of the Spanish nobles as duke of Tetuan. He remained prime minister till 1866, when his cabinet was upset by Narvaez. He then received leave of absence—that is to say, was exiled, and spent the most of his time in Paris. He died at Biarritz in 1867. The O'Donnell ministry improved the finances, army, and administration of Spain.

ODONTASPID'IDÆ, a family of sharks nearly related to the mackerel shark, but having shape more like that of ordinary sharks. Head depressed; eyes have no nictitant membrane; nostrils simple and far from the mouth, which is wide and inferior; teeth nail like, with basal cusps in both jaws. Dorsal fins two, the first in front of the ventrals. Tail has no pits at the root, and no lateral keels. The family is a small one, one species, *O. ferox*, inhabiting the Mediterranean; and there is an American Atlantic species, known as *sand shark*, which is also said to be found at the cape of Good Hope, and at Tasmania and Australia.

ODONTOL'OGY. See TEETH, *ante*.

ODONTOR'NITHES, a sub-class of birds whose fossils have been found by Marsh in the cretaceous formation of Kansas. They include two orders, odontolcæ, and odontormæ. The order odontolcæ was founded by Marsh for the reception of the extraordinary *hesperornis regalis*. The fossil of this gigantic bird indicates that in many points of structure it resembled the loons of the present day. It measured between 5 and 6 ft. from the bill to the toes, and it stood nearly as high. Its jaws were furnished with numerous conical, recurved teeth, sunk deep in a continuous groove. The front of the under jaw was not furnished with teeth, and was probably encased in a horny beak. The breast-bone had no central ridge or keel, and the wings were too small for a bird of flight. The tail consisted of about 12 vertebræ, of which the last three or four were amalgamated to form a flat, terminal mass. The tail was probably capable of a considerable up and down movement, enabling it to act as a paddle. The cervical and dorsal vertebræ were of the ordinary bird type. The legs were powerful and the feet adapted for rapid paddling. It was undoubtedly a swimming and diving bird, larger than any of the present day, and probably lived upon fishes. *Lestornis crassipes*, also of the cretaceous, is nearly related to *hesperornis;* and *enaliornis* of the cretaceous of Great Britain is probably allied to the same genus, but the formation of its jaws is unknown. The next order, odontolcæ, was founded by Marsh for the reception of two remarkable birds which he has named *ichthyornis dispar* and *apatornis celer*. *Ichthyornis dispar* may be taken as the type of the order. Its teeth were contained in distinct sockets instead of grooves as in *hesperornis*. They were small, compressed, and pointed, and all of them which have been preserved are of simillar form. The lower jaw contained about twenty on each side, all more or less inclined backward. Those in the upper jaw resembled those in the lower. The skull was of moderate size, and the eyes placed well forward. The jaws were long and slender, and apparently not encased in a horny sheath. The articular faces of the vertebræ were biconcave, as in fishes. The wings were large in proportion to the legs, and the humerus had an extended radial crest. The metacarpal bones were united as in ordinary birds. Whether the tail was elongated cannot at present be determined, but the last vertebra of the sacrum was very large. The fossil found by prof. Marsh was that of an adult, and about the size of a pigeon. The species was carnivorous, and probably aquatic. *Apatornis* resembled *ichthyornis*, but was rather more slender.

ŒCOLAMPADIUS, JOANNES—a name Latinized, according to the fashion of the age, from the German JOHANN HAUSSCHIEN—one of the most eminent of the coadjutors of Zwingli in the Swiss Reformation, b. in 1482 at Weinsberg, in Swabia. His father destined him for the profession of the law, and he studied for it in Heidelberg and Bologna; but yielding to his own strong inclination, he relinquished this study for that of theology, which he prosecuted at Heidelberg. He then became tutor to the sons of the elector Palatine, and subsequently preacher in Weinsberg. This office he resigned in order to study the Greek language under Reuchlin at Stuttgart. He also learned Hebrew from a Spanish physician, Matthew Adrian. Being appointed preacher at Basel, he formed the acquaintance of Erasmus, who highly appreciated his classical attainments, and employed his assistance in his edition of the New Testament. In 1516, Œcolampadius left Basel for Augsburg, where also he filled the office of preacher, and where he entered into a convent. But Luther's publications exercised so great an influence on him that he left the convent, and became chaplain to Franz von Sickingen, after whose death he returned to Basel in 1522, and in the capacity of preacher and professor of theology, commenced his career as a reformer. He held disputations with supporters of the church of Rome, in Baden in 1526, and in Bern in 1528. In the controversy concerning the Lord's supper, he gradually adopted more and more the views of Zwingli, and at last maintained them in 1525, in a treatise, to which the Swabian ministers replied in the *Syngramma Suevicum*. In 1529 he disputed with Luther in the conference at Marburg. He died at Basel, Nov. 23, 1531, not long after the death of his friend Zwingli. He was remarkable for his gentleness of character. His treatise *De Ritu Paschali*, and his *Epistola Canonicorum Indoctorum ad Eccium*, are the most noted of his works.—See Herzog, *Das Leben des Joh. Œcolampadius* (1843); and Hagenbach's *Œcolampadius* (1859).

ŒCUMEN'ICAL (Gr. *oikoumenike*, "of, or belonging to, the *oikoumene*," "the world"), the name given to councils of the entire church, and synonymous with the more ordinary name "general." See COUNCIL. The conditions necessary to constitute an œcumenical council are a subject of much controversy. As the subject is of less importance in Protestant divinity, it will be enough to explain here that a council is said by Roman Catholic divines to be œcumenical in three different ways; viz., in convocation, in celebration, and in acceptation. For the first, the summons of the pope, direct or indirect, is held to be necessary; this summons must be addressed to all the bishops of the entire church. To the second, it is necessary that bishops from all parts of the church should be present, and in sufficient numbers to constitute a really representative assembly; they must be presided over by the pope, or a delegate or delegates of the pope; and they must enjoy liberty of discussion and of speech. For the third, the decrees of the council must be accepted by the pope, and by the body of the bishops throughout the church, at least tacitly. The last of these conditions is absolutely required to entitle the decrees of a council to the character of œcumenical; and even the decrees of provincial or national councils so accepted, may acquire all the weight of infallible decisions, in the eyes of Roman Catholics.

ŒDE'MA (Gr. *a swelling*) is the term applied in medicine to the swelling occasioned by the effusion or infiltration of serum into cellular or areolar structures. The subcutaneous cellular tissue is the most common, but is not the only seat of this affection. It is occasionally observed in the submucous and subserous cellular tissue, and in the cellular tissue of the parenchymatous viscera; and in some of these cases, it gives rise to symptoms which admit of easy recognition during life. Thus œdema of the glottis (see LARYNX) and œdema of the lungs constitute well-marked and serious forms of disease; while œdema of the brain, though not easily recognized during life, is not uncommonly met with in the *post-mortem* examination of insane patients.

Œdema may be either passive or active, the former being by far the most common. *Passive œdema* arises from impeded venous circulation (as from obstruction or obliteration of one or more veins; from varicose veins; from standing continuously for long periods, till the force of the circulation is partly overcome by the physical action of gravitation; from deficiency in the action of the adjacent muscles, which in health materially aids the venous circulation, etc.); from too weak action of the heart (as in dilatation or certain forms of valvular disease of that organ); or from a too watery or otherwise diseased state of the blood (as in chlorosis, scurvy, Bright's disease, etc.). By means of the knowledge derived from pathological anatomy, we can often infer the cause from the seat of the swelling; for example, œdema of the face, usually commencing with the eyelids, is commonly caused by obstruction to the circulation through the left side of the heart, or by the diseased state of the blood in Bright's disease; and œdema of the lower extremities most commonly arises from obstruction in the right side of the heart, unless it can be traced to the pressure of the gravid uterus, or of accumulated fæces in the colon, or to some other local cause.

Active œdema is associated with an inflammatory action of the cellular tissue, and is most marked in certain forms of erysipelas. It is firmer to the touch, and pressure with the finger produces less pitting than in the passive form.

From the preceding remarks, it will be seen that œdema is not a disease, but a symptom, and ofen a symptom indicating great danger to life. The means of removing it must be directed to the morbid condition or cause of which it is the symptom.

OE'DENBURG, a co. in w. Hungary, bounded by Lower Austria, Raab, Eisenburg, and Wieselburg; 1280 sq.m.; pop. '70, 230,158; drained by the Raab, Leitha, and Rabuitz rivers, and intersected by the Vienna and Cilly railroad. Lake Neusiedler, one of the largest of Hungary proper, is included in the district. The surface is level and fertile in the s. and e., but mountainous in the n., and covered by forests. The staples are wine, tobacco, corn, wheat, honey, and wax. Potash, niter, refined sugar, cotton and woolen goods, are manufactured. Capital, Oedenburg.

OE'DENBURG (Hung. *Sovrony*; anc. *Sempronium*), a t. of Hungary, capital of a county of the same name, situated in an extensive plain, about 3 m. w. from the Neusiedler see, on the Ilkva, a branch of the Raab. It is connected by railway with Vienna. Oedenburg is one of the most beautiful towns in Hungary. It has manufactures of cotton and woolen goods, potash, nitre, tobacco, sugar, earthenware, glass, cutlery, etc.; and a considerable trade in wine, corn, tobacco, wax, honey, and cattle, the products of the neighborhood, which is rich and well cultivated. The wine of Rust, a small town 8 m. n. of Oedenburg, on hills sloping to the Neusiedler see, is one of the best wines of Hungary, and inferior only to Tokay. The Roman station of *Sempronium* was one of considerable importance; and numerous Roman remains are found near Oedenburg. The inhabitants of Oedenburg are mostly of German race. Pop. '69, 21,108.

Œ'DIPUS (Gr. *Oidipous*), the hero of a celebrated legend, which, though of the most revolting nature in itself, has supplied both Euripides and Sophocles with the subject-matter of some of their most celebrated tragedies. The story, as generally related, is as follows: Œdipus was the son of Laius, king of Thebes, by Jocaste; but his father having consulted the oracle to ascertain whether he should have any issue, was informed that his wife would bring forth a son, by whom he (Laius) should ultimately be slain. Determined to avert so terrible an omen, Laius ordered the son which Jocaste bare him to have his feet pierced through, and to be exposed to perish on Mount Cithæron. In this help-less condition, Œdipus was discovered by a herdsman, and conveyed to the court of Polybus, king of Corinth, who, in allusion to the swollen feet of the child, named him *Œdipus* (from *oideo*, to swell, and *pous*, the foot); and along with his wife, Merope, brought him up as his own son. Having come to man's estate, Œdipus was one day taunted with the obscurity of his origin, and in consequence proceeded to Delphi, to consult the oracle. The response which he received was, that he would slay his father, and commit incest with his mother. To escape this fate, he avoided returning to Corinth, and proceeded to Thebes, on approaching which he encountered the chariot of his father; and the charioteer ordering him out of the way, a quarrel ensued, in which Œdipus ignorantly slew Laius, and thus unconsciously fulfilled the first part of the oracle. The famous Sphinx (q.v.) now appearrd near Thebes, and seating herself on a rock, propounded a riddle to every one who passed by, putting to death all who failed to solve it. The terror of the Thebans was extreme, and in despair they offered the kingdom, together with the hand of the queen, to the person who should be successful in delivering it from the monster. Œdipus came forward; the Sphinx asked him, "What being has four feet, two feet, and three feet; only one voice; but whose feet vary, and when it has most, is weakest?" Œdipus replied that it was "Man;" whereupon the Sphinx threw itself headlong from the rock. Œdipus now became king, and husband of his mother, Jocaste. From their incestuous union sprung Eteocles, Polynices, Antigone, and Ismene. A mysterious plague now devastated the country, and when the oracle declared that before it could be stayed, the murderer of Laius should be banished from the country. Œdipus was told by the prophet Tiresias that he himself had both murdered his father and committed incest with his mother. In his horror he put out his own eyes, that he might no more look upon his fellow-creatures, while Jocaste hanged herself. Driven from his throne by his sons and his brother-in-law, Creon, Œdipus wandered towards Attica, accompanied by Antigone, and took refuge in the grove of the Eumenides, who charitably removed him from earth; but the latter part of his life is differently told.

Œ'GIR, in Scandinavian mythology, the ocean god, a jotun, but friendly to Odin.

ŒHLENSCHLÄGER, ADAM GOTTLOB, the greatest poet of northern Europe, was b. in 1779, at Copenhagen. His early years were spent at the palace of Fredericksborg, in the neighborhood of the Danish capital, where his father was employed, first as organist, and afterwards as steward or bailiff. During the absence of the royal family in the winter, Œhlenschlager and his sister amused themselves in roaming over the palace, and examining the paintings and works of art which it contained, and in improvising private theatricals, for which he supplied original pieces. After an irregular and desultory course of education, Œhlenschläger's love of the drama led him to offer his services to the manager of the Copenhagen theater; but, discovering soon that he had no chance of rising above the rank of a mere supernumerary, he entered the university of Copenhagen as a student of law. For a time he seems to have pursued his studies with tolerable assiduity, under the direction of his friend, A. S. Oersted, who, together with his distinguished brother, H. C. Oersted (q.v.), had cemented a life-long friendship with him. Œhlenschlager's studies were interrupted in 1801, when, on the bombardment of Copenhagen by Nelson and Parker, he and his friends served in the student-corps of volunteers. After this event, which roused the dormant patriotism of the nation, Œhlenschläger found the study of law too irksome, and devoted all his energies to the cultivation of the history and mythology of his own country. In 1803 appeared his first collection of poems, including one longer dramatic piece, *St. Hans Aften-Spil*, which attracted favorable notice for the lively fancy with which national habits and local characteristics were portrayed. The *Vaulunders Saga* in the *Poetiske Skrifter*, published in 1805, and his *Aladdin's forunderlige Lampe*, completed his success, and raised him to the rank of the first of living Danish poets; the former of these works having shown a marvelous capacity for reflecting the dark and stern coloring of the old northern Sagas, while the latter gave evidence of a rich and genial poetic fancy. These early efforts were rewarded by the acquisition of a traveling pension, which enabled him to spend some years in visiting various parts of the continent, and becoming acquainted with the great literary celebrities of the day, such as the Weimar circle, of whom Goethe was the head. During this period, Œhlenschläger wrote his *Hakon Jarl*, the first of his long series of northern tragedies, at Halle (1807; Eng. trans. by F. C. Lascelles, (1875), and his *Coreggio*, at Rome (1809; Eng. trans. by Theodore Martin, 1854). In 1810 Œhlenschläger returned to Denmark, where he was hailed with acclamation as the greatest tragic poet Denmark had ever known; and having soon afterwards obtained the chair of æsthetics at the university, and received various substantial proofs of royal favor, he married, and settled in the capital, where his peace was, however, rudely disturbed by a literary feud with Baggesen, the Danish poet and critic, whose poetical supremacy had been superseded by that of Œhlenschläger. In 1819 appeared one of Œhlenschläger's most masterly productions, *Nordens Guder*, and this and the numerous dramatic compositions written about the same period, show that the severe criticism to which his writings had been exposed during the celebrated Bagessen quarrel, had corrected some of the faults, and lessened the self-conceit which had characterized his earlier works. His reputation spread with his increasing years both abroad and at home; and after having repeatedly visited the more southern parts of Europe, he went, in 1829, to Sweden, where his arrival was welcomed by a public ovation; and after having received repeated marks of friendship from various sovereigns, he was honored in his own country by the celebration, in 1849, of a grand public festival, held in the palace at Copenhagen. But this ovation was unfortunately followed in less than two months by his death, which took place in Jan., 1850. His funeral was kept as a national solemnity, and he was followed to the grave by a civic procession, which included members of every class of society, from princes to artizans. The fame of Œhlenschläger will rest principally on his tragedies, of which he wrote 24, 19 of the number being on northern subjects. These were all composed originally in Danish, and re-written by himself in German. Besides those already referred to, the best are *Knud den Store*, *Palnatoke*, *Axel og Walborg*, *Væringerne i Miklagord*. His poems are for the most part indifferent, and his numerous prose writings deserve little notice. His Danish and German works amount in all to 62 volumes, to which must be added 4 volumes of his *Erindringer*, or *Autobiographical Recollections*, published after his death.

OEHLER, Gustav Friedrich, 1812–72, b. Würtemburg, and, having studied theology at Tübingen, was, 1834–37, a lecturer in the missionary institution at Basle, after which he returned to the theological seminary at Tübingen, teaching also in the university there. In 1840 he became vicar at Stuttgart and professor in the theological seminary at Schonthal. In 1845 he was chosen a member of the theological faculty at Breslau, and continued there until 1852, when he was called back to Tübingen where he lectured and was superintendent of the theological faculty. He published many essays and reviews, and several larger works. He was especially devoted to the study of the Old Testament for which he had a profound reverence as containing the commencement of the supernatural revelation which is completed in the New Testament. He held that the connection between the two is so intimate and essential that the genesis of all the New Testament ideas of salvation is found in the Old, and that the two must stand or fall together. His chief book is *The Theology of the Old Testament*.

ŒIL DE BŒUF, a French term literally signifying ox's eye, applied in architecture to those small round or oval openings in the frieze or roof of large buildings, which serve to give light to spaces otherwise dark. The most famous is that in the anteroom (where the courtiers waited) of the royal chamber at Versailles, which gave name to the apartment. Hence the expression, *Les Fastes de l'Œil-de-Bœuf*—i.e., the history of the courtiers of the Grand Monarque, and by extension, of courtiers in general.

Œ'LAND, a long and narrow island in the Baltic, lying off the eastern coast of Sweden, opposite to, and forming part of, the län of Kalmar, and at a distance of from 4 to 17 m. from the shore. It is 85 m. in length, and from 2 to 8 m. in breadth. The area is 588 sq.m., and the pop. 40,050. The island, which is scarcely more than a lime cliff, is scantily covered with soil, but in some parts it is well wooded, and has good pasture-ground, which is turned to account by the islanders, who rear cattle, horses, and sheep. In favorable seasons, barley, oats, and flax yield good crops. The fishing is excellent all round the coasts. There are large alum-works on the island, and an extensive line of wind-mills along the range of the Alwar hills, near which stands Borgholm (pop. 829), the only town on the island, the first foundations of which were laid in 1817. To the n. of the island lies the steep but wooded island-cliff, the Jungfruen, or Blaakulla, which bears the mythical reputation of having been the scene of various deeds of witchcraft, and the favorite resort of wizards and witches.

OELS, a small t. of Prussian Silesia, stands on a plain on the Oelsa, or Oelse, 16 m. e.n.e. of Breslau. Its castle, built in 1558, is surrounded by ramparts and ditches. It contains a gymnasium, several churches, and other public edifices. Pop. '75, 8,874, who carry on manufactures of shoes and of cloth goods.

ŒNANTHY'LIC ACID ($C_{14}H_{13}O_3,HO$) is one of the volatile fatty acids of the general formula $C_{2n}H_{2n}O_4$. It is a colorless oily fluid, with an aromatic odor, lighter than water, and insoluble in that fluid, but dissolving readily in alcohol and ether. According to Miller (*Organic Chemistry*, 2d ed. p. 355), it may be exposed to a cold of 0° without becoming solid; while it boils and may be distilled (with partial decomposition) at 298°. It is (like many of the allied fatty acids) one of the products of the oxidation of oleic acid (q.v.) by nitric acid, and is likewise yielded by the action of nitric acid on castor oil, wax, and various fats. Its most characteristic salt is the œnanthylate of copper, which crystalizes in beautiful green needles.

ŒNOTHE'RA, a genus of plants of the natural order *Onagraceæ* (q.v.), having four petals and eight stamens, the calyx-limb 4-cleft, the segments reflexed; the capsule 4-valved, with many naked seeds. The Evening Primrose (*Œ. biennis*), a native of Virginia, has been known in Europe since 1614, and is now naturalized in many parts of Europe and in some parts of Britain, on the banks of rivers, in thickets, on sandy grounds, etc. It is a biennial plant, and produces in the first year elliptic or obovate obtuse leaves, and in the second year a stem of 1½–4 ft. high, which bears at its summit numerous yellow flowers in a leafy spike. The flowers are fragrant in the evening. The root somewhat resembles a carrot in shape, but is short; it is usually red, fleshy and tender; it is eaten in salads or in soups, and as a boiled vegetable. The plant is often cultivated for the sake of its large yellow flowers. Several other species of *Œnothera*. natives of North America, are occasionally cultivated in our gardens, and have eatable and pleasant roots.

OERE'BRO, an inland t. of Sweden, capital of a län of the same name, is situated at the entrance of the Swart-Elf into the Hellmar lake, 100 m. w. of Stockholm. Pop. '76, 10,496. The town still retains many memorials of its earlier prosperity, when it was frequently the residence of the Swedish rulers, who found its central position in the more fertile southern portion of the kingdom favorable both in regard to safety and pleasantness of site. The old castle was built by Berger Jarl in the 18th c., and was in after-times frequently chosen as the seat of the national diets. Oerebro has manufactories of waxcloth, carpets, woolen goods, stockings, guns, and mirrors; and these industrial products, together with the minerals obtained from the neighboring silver, copper, and iron mines, are conveyed to Gothenborg and Stockholm by means of the extensive system of canals which connects the lakes of the interior with the maritime ports.

OERSTED, ANDERS SANDÖE, 1778–1860; b. in the island of Langeland belonging to Denmark; was educated at the university of Copenhagen, embraced the profession of law and rose to eminence as a successful practitioner and as editor of the *Juridiskt Archir* and other legal periodicals; he also wrote several treatises on the philosophy of Kant and Hegel. In 1825 he was intrusted with the drawing up of the ordinances of the Danish law, and in 1831 had an important share in forming the provincial constitutions granted by Frederick VI. to the states. For several years he was high commissioner, or king's representative, at the assembly of the states, and from 1841 to 1848 was a member of the Danish cabinet. In 1853 he again entered the cabinet as prime minister of Frederic VII., and acted as minister of the interior, of public worship, and of public instruction. Up to this time he had been considered as favoring constitutional reform, but he soon showed himself a violent reactionist. Public feeling was very strong and a revolution seemed at hand, but at the close of 1854 the king dismissed the Oersted cabinet. The point on which the contest of liberalism and prerogative turned was the right of the crown to grant new constitutions to Schleswig and Holstein without the consent of the diet. In 1855 Oersted and his colleagues in the cabinet were impeached by the diet; the trial lasted for a year and resulted in an acquittal under the Denmark law, the vote standing eight for conviction and eight for acquittal. An autobiography of Oersted was published 1851–57, and contains valuable material for Danish historians.

OERSTED, HANS CHRISTIAN, one of the most distinguished scientific discoverers and physicists of modern times, was b. in 1777 at Rudkjobing, on the Danish island of Langeland, where his father practiced as an apothecary. In 1794 he entered the university of Copenhagen, where he took the degree of doctor of philosophy in 1799, and soon afterward became assistant to the professor of medicine, in which capacity he gave lectures on chemistry and natural philosophy. In 1806, after having enjoyed a traveling scholarship for several years, and visited Holland, the greater part of Germany, and Paris, he was appointed extraordinary professor of natural philosophy in the university of Copenhagen. In 1812, he again visited Germany and France, after having published a manual under the title of *Videnskaben our Naturen's Almindelige Love*. and *Förste Indledning til den Almindelige Naturlære* (1811). During his residence at Berlin, he wrote his famous essay on the identity of chemical and electrical forces, in which he first developed the ideas on which were based his great discovery of the intimate connection existing between magnetism and electricity and galvanism—a treatise which, during his residence in Paris, he translated into French, in conjunction with Marcel de Serres. In 1819, he made known these important truths in a Latin essay, entitled *Experimenta circa efficaciam Conflictus Electrici in acum Magneticam*, which he addressed to all the scientific societies and the leading savans of Europe and America, and thus made good his claim to be regarded as the originator of the new science of electro-magnetism. This discovery which formed one of the most important eras in the history of modern physical science, obtained for Oersted the Copley medal from the royal society of England, and the principal mathematical prize in the gift of the institute of Paris. The original and leading idea of this great discovery had been in his mind since 1800, when the discovery of the galvanic battery by Volta had first led him to enter upon a course of experiments on the production of galvanic electricity. The enunciation of his theory of electro-magnetism was followed by many important experiments in regard to the compression of water, and by numerous other chemical discoveries, among which we may instance his demonstration of the existence of the metal aluminium in alumina. The influence which Oersted exerted on the science of the day by his discoveries was recognized by the learned in every country, and honors increased upon him with increasing years. He was corresponding member of the French institute, perpetual secretary to the royal society of sciences in Copenhagen, a knight of the Prussian order of merit, of the French legion of honor, and of the Danish order of the dannebrog, and a councilor of state. Oersted's great object through life was to make science popular among all classes, in furtherance of which he wrote numerous works, contributed scientific papers to the newspapers and magazines of his own country and Germany, and in addition to his regular prelections in the university, gave courses of popular scientific lectures to the public including ladies. Among the works specially written to promote the diffusion of scientific knowledge, those best known are *Aanden i Naturen* (Kop. 1845), and *Natur-læren's Mehanische Deel* (Kop. 1847), both of which have been translated into several other European languages. The majority of his more important physical and chemical papers are contained in Poggendorff's *Annalen*, and were written by him in German or French, both of which he wrote with the same facility as his own language. At the close of 1850, a national jubilee was held in honor of the 50th anniversary of his connection with the university of Copenhagen—a festival which he did not long survive, as his death occurred at Copenhagen Mar. 9, 1851. A public funeral, attended by all persons distinguished by rank or learning in the Danish capital, bore testimony to the respect and esteem with which he was regarded by his fellow-citizens, among whom his memory is cherished, not merely as one of the greatest scientific benefactors of his times, but as a man who contributed largely, by his eloquent and earnest advocacy of liberal principles, to the attainment of the high degree of constitutional freedom which Denmark now enjoys.

OE'SEL, an island of Russia, in the Baltic, belonging to the government of Livonia, and lying across the mouth of the gulf of Riga. It is about 80 m. in length from n.e. to s.w., and about 40 m. in greatest breadth, but the s.w. end consists of a comparatively narrow peninsula. A narrow strait separates the n.e. end from the island of Dago. The surface is undulating, broken by low hills, marshy, watered by numerous small streams, and well wooded. The coast is generally formed by high cliffs. The climate is milder than that of the neighboring continental districts. The rocks are generally calcareous, and the soil is in many places gravelly; the chief crops are wheat, oats, rye, barley, and pease. The rearing of cattle, horses, and sheep, and fishing, are, however, the principal occupations of the inhabitants. The seal-fisheries are of some importance. Pop. 46,000, mostly Lutheran. The only town is Arensburg, on the s.e. coast, with a pop. (1867) of 3,256. Many of the inhabitants of Arensburg are of German descent, as are the nobles and clergy of the island; but the peasantry are Esthonian. The islanders of Oesel were in early times noted as pirates. The Danish king Waldemar conquered the island in the beginning of the 13th century. Albert von Buxhövden, bishop of Leal in Livonia, obtained it from Denmark in 1227, in order that he might reduce its inhabitants to subjection, and convert them to Christianity. Being partly subdued by the Teutonic knights, it remained for more than 300 years under its bishops, the seat of the bishopric being transferred to the island. The last bishop sold it to Denmark in 1559. It remained a Danish province till 1645, when it was given up to Sweden, and in 1721 fell into the hands of Russia.

ŒSOPH'AGUS (Gr. *oio*, to convey, and *phagein*, to eat), or GULLET, a membranous canal, about 9 in. in length, extending from the pharynx to the stomach, and thus forming a part of the alimentary canal. It commences at the lower border of the cricoid cartilage of the larynx, descends in a nearly vertical direction along the front of the spine, passes through an opening in the diaphragm, and thus enters the abdomen, and terminates in the cardiac orifice of the stomach opposite the ninth dorsal vertebra. It has three coats—viz., an external or muscular coat (consisting of two strata of fibers of considerable thickness—an external, longitudinal, and an internal, circular); an internal or mucous coat, which is covered with a thick layer of squamous epithelium; and an intermediate cellular coat, uniting the muscular and mucous coats. In this tissue are a large number of œsophageal glands, which open upon the surface by a long excretory duct, and are most numerous round the cardiac orifice, where they form a complete ring.

The œsophagus is liable to a considerable number of morbid changes, none of which are, however, of very common occurrence.

The most prominent symtom of *œsophagitis*, or *inflammation of the œsophagus*, is pain between the shoulders, or behind the trachea or sternum, augmented in deglutition, which is usually more or less difficult, and sometimes impossible. The affection is regarded as a very rare one, unless when it originates from the direct application of irritating or very hot substances, or from mechanical violence—as, for instance, from the unskillful application of the stomach-pump or probang. Dr. Copland, however, is of opinion that it is not unfrequent in children, particularly during infancy, and observes that "when the milk is thrown up unchanged, we should always suspect the existence of inflammation of the œsophagus." The ordinary treatment employed in inflammatory diseases must be adopted; and if inability to swallow exists, nourishing liquids, such as strong beef-tea, must be injected into the lower bowel.

Spasm of the œsophagus—a morbid muscular contraction of the tube, producing more or less difficulty of swallowing—is a much more common affection than inflammation. The spasm generally comes on suddenly during a meal. Upon an attempt to swallow, the food is arrested, and is either immediately rejected with considerable force, or is retained for a time, and then brought up by regurgitation; the former happening when the contraction takes place in the upper part of the canal, and the latter when it is near the lower part. In some cases, solids can be swallowed, while liquids excite spasm; while in other cases the opposite is observed; but in general either solids or liquids suffice to excite the contraction, when a predisposition to it exists. The predisposition usually consists in an excitable state of the nervous system, such as exists in hysteria, hypochondriasis, and generally in a debilitated condition of the body. An attack may consist of a single paroxysm, lasting only a few hours, or it may be more or less persistent for months or even years. The treatment must be directed to the establishment of the general health, by the administration of tonics and anti-spasmodics, by attention to the bowels and the various secretions, by exercise in the open air, the shower-bath, a nutritious diet, etc.; and by the avoidance of the excessive use of strong tea, coffee, and tobacco. Care must also be taken not to swallow anything imperfectly masticated or too hot; and the occasional passage of a bougie is recommended. Brodie relates a case that ceased spontaneously on the removal of bleeding piles. Strychnia is deserving of a trial when other means fail; and if the affection assume a decidedly periodic form, quinia will usually prove an effectual remedy.

Paralysis of the œsophagus is present in certain forms of organic disease of the brain or spinal cord which are seldom amenable to treatment, and is often a very important part of the palsy that so frequently occurs in the most severe and chronic cases of insanity. In this affection there is inability to swallow, but no pain or other symptom of spasm; and a bougie may be passed without obstruction. The patient must be fed by the stomach-pump, and nutrient injections of strong beef-tea should be thrown into the lower bowel.

Permanent or organic stricture of the œsophagus may arise from inflammatory thickening and induration of its coats, or from scirrhous and other formations, situated either in the walls of or external to the tube. The most common seat of this affection is at its upper part. The symptoms are persistent and gradually increasing difficulty of swallowing, occasionally aggravated by fits of spasm; and a bougie, when passed, always meets with resistance at the same spot. When the contraction is due to inflammatory thickening, it may arise from the abuse of alcoholic drinks, or from swallowing boiling or corrosive fluids; and it is said that it has been induced by violent retching in sea-sickness. If unrelieved, the disease must prove fatal, either by ulceration of the tube around the seat of the stricture, or by sheer starvation. When the affection originates in inflammation, some advantage may be derived from a mild course of mercury, occasional leeching, and narcotics; and especially from the occasional passage of a bougie, of a ball-probang (an ivory ball attached to a piece of whalebone), or of a piece of sponge moistened with a weak solution of nitrate of silver. If it is dependent upon malignant disease, and the tissues have become softened by the infiltration of the morbid deposit, the bougie must be directed with the greatest care through the stricture, as a false passage may be easily made into important adjacent cavities.

Foreign bodies not very unfrequently pass into the œsophagus, and become impacted there, giving rise to a sense of choking and fits of suffocative cough, especially when they are seated in its upper part. They may not only cause immediate death by exciting spasm of the glottis, but if allowed to remain, may excite ulceration of the parts, and thus cause death by exhaustion. If the body is small and sharp (a fish-bone, for example), it may often be got rid of by making the patient swallow a large mouthful of bread; if it is large and soft (such as too large a mouthful of meat), it may generally be pushed down into the stomach with the probang; while large hard bodies (such as pieces of bone) should be brought up either by the action of an emetic, or by long curved forceps. If the offending body can neither be brought up nor pushed down, it must be extracted by the operation of *œsophagotomy*—an operation which can only be performed when the impacted body is not very low down, and which it is unnecessary to describe in these pages.

ŒSTRIDÆ, a family of dipterous insects, having a mere rudimentary proboscis or none, the palpi also sometimes wanting, and the mouth reduced to three tubercles; the antennæ short and inclosed in a cavity in the forepart of the head; the abdomen large. They are generally very hairy, the hair often colored in rings. They resemble flesh-flies in their general appearance, and are nearly allied to *muscidæ*. The perfect insect is very short-lived. The females deposit their eggs on different species of herbivorous mammalia, each insect being limited to a particular kind of quadruped, and selecting for its eggs a situation on the animal suitable to the habits of the larva, which are different in different species, although the larvæ of all the species are parasites of herbivorous quadrupeds. The characters and habits of some of the most notable species are described in the article BOT. Animals seem generally to have a strong instinctive dread of the œstridæ which infest them.

OETINGER, FRIEDRICH CHRISTOPH, 1702–82; b. Göppingen, in Würtemberg; studied at the university of Tübingen, where he met those who styled themselves the *inspired*, and devoted himself to the mystical philosophy of Leibnitz and Wolf. After finishing his course at the university he became intimate with Bengel, with whom he corresponded and whom he frequently visited. His aim was to infuse more of the biblical element into the philosophy of Wolf, and to "ascertain therein the final principles and highest unity of all thought." He read carefully the church fathers, especially Augustine, and studied the Rabbins and their cabalistic speculations. He became acquainted with Francke, Spangenberg, and Zinzendorf. After traveling extensively he returned to Tübingen, where, having served as tutor and aided Zinzendorf in the translation of the Scriptures, he was appointed reader of theology in the university of Halle. This post he resigned, and went to Holland to confer with its eminent theologians. Returning to Würtemberg he was appointed in 1738 pastor at Hirschau. Having adopted the views of the Pietists, "with whom his purity of life, earnestness of manner, extensive theological acquirements, and, perhaps, his mysticism of style, all combined to give him great influence," he became their leader in that part of Germany. About this time he became an earnest student of the writings of the mystic Böhme, and also an ardent disciple of Emanuel Swedenborg, some of whose writings he translated into German. He attempted to arrange a system of theology on the mystical interpretation of Scripture. In 1765 he published a treatise entitled *Earthly and Heavenly Philosophy*, which, with his translation of the works of Swedenborg, brought upon him the reprehension of his ecclesiastical superiors. Yet he was protected by the duke of Würtemberg, and was nominated to the superintendence of the churches in the district of Weinsberg, afterward in that of Herrenberg, and subsequently appointed prelate at Murhard, where he continued till his death. He was held in high regard as a philosopher and theologian by those who adopted his views. He wrote several philosophical and cabalistic works, and spent much time in studying the art of transmuting metals. His autobiography was published at Stuttgart in 1845, and a complete edition of his works was collected and edited in 1852 by Ehmann, who published his life and letters. The works of Oetinger amount to about seventy, the best of which is *Theologia ex Idea Vitæ Deducta.*

OETTINGEN, a former German co. in the Riesgau, Swabia, now divided between the Spielberg and Wallenstein lines, and belonging partly to Würtemberg and partly to Bavaria. It existed from about 1200, and was mediatized 1806–10.

O'FALLON, John, b. Ky., 1791; served in the war of 1812 under gen. Harrison, being wounded at Tippecanoe; was a merchant of St. Louis, Mo., where he acquired vast wealth, and has given more than a million dollars to charitable and other institutions, among which is the O'Fallon polytechnic institution, which he endowed to the amount of $100,000.

OFEN. See Buda, *ante.*

OFFA'S DYKE, a remarkable relic of antiquity, an entrenchment extending along the whole border of England and Wales, from the n. coast of Flintshire, on the estuary of the Dee, through the counties of Denbigh, Montgomery, Salop, Radnor, and Hereford, into Gloucestershire, where its southern termination is near the mouth of the Wye, in the grounds of Sedbury park, which overlook the estuary of the Severn. In some places it is nearly obliterated by cultivation; in others it is of considerable height, although its appearance nowhere indicates that it can ever have been of much value as a rampart. It is therefore generally supposed to have been chiefly intended as a line of demarcation. Nearly parallel with it, but at a distance varying from a few hundred yards to 3 m., on the eastern or English side of it, is *Watt's dyke*, a similar relic of antiquity, which, however, seems never to have been so great a work, and is now in many places much obliterated. It has been conjectured that the space between them was neutral ground where the Anglo-Saxons and Welsh met for trading or other purposes. The principal dyke is ascribed by tradition to Offa, king of Mercia, who reigned in the 8th c.; but this is matter of tradition, and not of history.

OFFENBACH, a manufacturing t. of Hesse-Darmstadt, on the s. bank of the river Main, within the domains of the princes of Isenburg-Birstein, 4 m. s.e. of Frankfurt. Pop. '70, 22,691. Offenbach is pleasantly situated in one of the richest parts of the valley of the Main, and is one of the most important manufacturing towns in the province. Among the industrial products, its carriages have acquired a pre-eminent character for excellence; and next to these stand its bookbindings, articles of jewelry, gold and silver goods, carpets, and silk fabrics. It has also good manufactories of wax-cloth, papier-mâché snuff-boxes, tin-lackered wares, umbrellas and parasols, wax-candles, leather, hats, tobacco, sugar, and ginger-bread and spiced cakes. Offenbach has several churches, and a Jewish synagogue. The palace is the winter residence of the Isenburg-Birstein family, to whom the old castle, now in ruins, also belongs. A pontoon-bridge across the river, and a railway to Frankfurt, facilitate intercommunication, and tend materially towards the maintenance of its active trade.

OFFENBACH, Jacques, a composer of dramatic music, who enjoys high popularity over the continent, of German birth, but a naturalized Frenchman. He was born in 1819, became *chef d'orchestre* in the Théâtre Français in Paris in 1847, and afterwards manager of the Théâtre des Bouffes Parisiens. He has composed a vast number of light lively operettas, *Le Mariage aux Lanternes; La Fille d'Elezondo*, etc., perfect as musical trifles; but the productions by which he is best known are a series of *buffonneries musicales*, or burlesque operas, including *Orphée aux Enfers; La Belle Hélène; La Barbe Bleu; La Grande Duchesse; Geneviève de Brabant*, and *Roi Carotte*, composed with the rather questionable aim of parodying music of a more serious description. *Madame Favart* has become almost as popular in England as in France.

OFFENSES Against Religion, Public Peace, etc. See Religion, Peace, etc.

OFFER and **ACCEPTANCE** is one mode of entering into a contract of sale. At an auction, the highest offer is generally accepted as a matter of course; and when accepted, the contract is completed. An offer is often made by letter from one merchant to another to buy or sell goods. In such a case, the party offering is bound to wait until he gets an answer by return of post or messenger; for until then the offer is supposed to be continuously made. But if A offer to B personally to sell, and B ask time to consider for a day, or any given time, A is not bound to wait a single moment, according to English law, and may withdraw at any time from the offer, because he had no legal consideration for waiting; whereas, in Scotland, in the same circumstances, A would be bound to wait the time agreed upon.

OFFERING. Under the head FIRST-FRUITS (q.v.) have been described the various offerings prescribed in the Jewish law. We shall have occasion to consider, under the head of SACRIFICE (q.v.), some further questions connected with the subject of offerings in public worship. In the Christian community there appears to have existed, from the earliest times, a practice of making voluntary offerings, for purposes not directly connected with public worship. See OFFERTORY.

OF'FERTORY (Lat. *offertorium*, from *offero*, I offer) is the name given to that portion of the public liturgy of the Roman Catholic church with which the eucharistic service, strictly so called, commences. In the Roman liturgy it consists of one or two verses from some book of Scripture, generally from the Old Testament, but sometimes also from the epistles. In the Ambrosian liturgy it consists of a prayer, similar in form to the *collect* or *secret* of the mass; and in both, this recital is followed by the preparatory offering up of the bread and wine, accompanied by certain ceremonies and forms of prayer.

This offering of the bread and wine in the public service became, from a very early period, the occasion of a voluntary offering, on the part of the faithful; originally, it would seem, of the bread and wine designed for the eucharistic celebration and for the communion of the priest and the congregation, sometimes even including the absent members, and also for the *agape*, or common sacred feast, which accompanied it. That portion of the offerings which remained in excess of what was requisite for these purposes was applied to the relief of the poor, and to the support of the clergy. These offerings were ordinarily made by the faithful in person, and were laid upon the altar: and the Ambrosian rite still preserves this usage in a ceremonial which may be witnessed in the cathedral of Milan. By degrees, other gifts were superadded to those of bread and wine—as of corn, oil, wax, honey, eggs, butter, fruits, lambs, fowl, and other animals; and eventually of equivalents in money or other objects of value. The last-named class of offerings, however, was not so commonly made upon the altar and during the public liturgy, as in the form of free gifts presented on the occasion of other ministerial services, as of baptism, marriages, funerals, etc.; and from this has arisen the practice in the Roman Catholic church of the mass-offering, or *honorarium*, which is given to a priest with the understanding that he shall offer the mass for the intention (whence the honorarium itself is often called an "intention") of the offerent. In some places, however, and among them in some parts of Ireland, offerings "in kind" are still in use, not indeed in the form of the ancient offertory, but in the shape of contributions of corn, hay, etc., at stated seasons, for the use of the parochial clergy. At weddings also, and in some places at funerals, offerings in money are made by the relations and friends of the newly married or of the deceased. In the liturgy of the English church allusion is made to the practice of oblations, and some of the recent controversies have turned upon the revival of the "offertory," which has found some advocates.

OFFICE, in law, may be ministerial or judicial, and is in law the right and duty of one or more persons to discharge the functions of some position of trust or honor, and to receive the emoluments appertaining thereto. An office is ministerial when its exercise depends on the command or direction of others; judicial, when the officer is called upon to employ his own discretion. An example of the first is a sheriff, of the second a judge of a court of law. The two are sometimes united in one. The office is held for the benefit of the public, may be abolished by legislation, unless such action be expressly forbidden by the constitution; and cannot be the subject of sale or devise, though in England certain ministerial offices are regarded as the property of the incumbent and may descend in the family. When the office is in its nature judicial, the duties cannot be performed by deputy, as the personal skill or judgment of the officer are the reasons for his holding the office. With ministerial offices the reverse is the case. Thus a sheriff or other court officer may appoint deputies, and their acts are good in law; while the appointing officer remains responsible for such acts. Statutes in most of the states provide that offices shall not be sold, and such a sale would be void anywhere as contrary to the policy of the common law. So any agreement between the officer and one who by influence procures his appointment, to divide the compensation received, would be altogether void. It was a principle of the common law that no term of office should be created so as to begin at a certain time in the future, nor for a fixed term of years, but should be held for life or during good behavior. This was to prevent the holding of office after competency to perform the duties had ceased, and to render it impossible that the office should survive the officer. It is common in this country to limit the term to the life of the incumbent and to the attaining of a certain age, as 70 years. Two offices cannot be held by the same person where one is in the nature of its duties inconsistent with the other. This inconsistency may be patent from the nature of the offices or it may be declared to exist by act of legislation. Where an office is filled in common by several persons, it has been held that if the office is of a public character all the officers must meet for consultation, but that a majority may act, while if the office is private, all must concur; but this is often governed by statute, and a decision by a majority, or even a majority of those present at any meeting, made binding. Members of state or national legislature are not usually termed officers, the word being confined in usage to those having executive or judicial authority. A *de facto* officer is one who is in possession of the authority and emoluments of an office without a good title thereto, while a *de jure* officer is one who has the legal right but not necessarily actual possession. It is evident that it would make much confusion and cause great injustice if all official acts of a *de facto* officer were to be considered as of no effect. Thus, in the case of a judge who was wrongfully on the bench, it would be a great hardship if all judgments given by him, and all criminal convictions of his court, should be set aside. But if suit be brought by a *de facto* officer in his public capacity, he may be debarred from recovery on the ground of defect in title, and the *de jure* officer may test the question of title by bringing a writ of *quo warranto*.

Public officers are appointed in the United States, under the provisions of the constitution, by the president with the advice and consent of the senate, with the exception that to congress is given the power to vest in the president alone, or in the heads of departments or courts of law, the appointment of "inferior officers." Ambassadors, public ministers and consuls, and supreme court judges are specified as not belonging to this "inferior" class, but beyond that the distinction is not clearly defined. In the various states the appointment of public officers is regulated by statutes, and even in the case of supreme court judges election is common. The appointee in most cases is required to take an oath to perform faithfully the duties of the office. A bond is often required where the officer has charge of financial interests or his duties affect property rights. Where he performs official acts before giving bond or taking oath, such acts will be valid unless he has been specially prohibited by statute or constitution from holding the office before the bond was filed or the oath administered. Compensation of officers may be fixed by law or may be obtained from fees. It is provided in the United States statutes that no officer of the government who holds an office with a salary of $2,500 or more shall receive extra compensation for performing the duties of any other office unless expressly authorized by law. Where an officer has been removed his salary will continue until proper notice of the appointment of his successor has been given him. Compensation does not begin until an officer is liable to duty. The law will presume that a public officer is acting within the scope of his duty until the reverse has been shown. Where discretionary power is given, the officer is made the exclusive judge of the facts. The officer is liable for wrongful acts both to the injured party and to the state. In the first cast remedy is by action, in the second by indictment or impeachment. The order of a superior is no bar to an action arising from an unlawful act of the inferior, nor is negligence on the part of a subordinate ground for holding the head officer responsible. Contracts made by public officers are governed by the general law of agency and they cannot bind the government beyond the extent of their legal authority. If an appropriation is exceeded, the officer is liable. A court officer cannot be held if acting under the proper order of a court having jurisdiction, but may be where there is no jurisdiction. If a sheriff seize property which is by law exempt, he is personally responsible. Fraud and embezzlement are made criminal offenses by statute. Forfeiture of office will follow such offenses, the proceeding being by information or *quo warranto*. The method of removing a public officer is not provided for in the constitution, and the question arises whether the power belongs to the president alone or whether he must receive he consent of the senate. Such "inferior" officers as may be appointed by congress may also be removed by proper legislation. It is said on the one hand, as to other officers, that there is a distinction between the right to nominate and the power of appointment, and that therefore the consent of the senate must be obtained in removing any officers in whose appointment it had a share. On the other hand, it is urged that removal is an executive act, that the power of nominating implies the power to remove, and that the public interest demands that the president should have power to dismiss an incompetent or dishonest official without the delay which would be entailed by awaiting the action of the senate. The question has several times come before congress, and the power of the president to act alone was sustained by a very close vote. In the contest of authority between president Andrew Johnson and congress the discussion on this point was very bitter. By statutes of 1867 and 1869 it was provided that a civil officer appointed by the advice and consent of the senate shall hold his place until removed by the same authority, but that during a recess of the senate the president may suspend such officer and appoint another to fill the duties of the position. The president is to make a nomination within 30 days after the beginning of the next session of the senate; and in case the senate directly refuse to confirm, he may nominate another person. These statutes are known as the tenure-of-office acts. State officers may in many cases be removed by the governor; the subject is governed by statutory enactments, which vary greatly in the different states. Elective offices cannot be vacated by an executive officer without showing cause, such as malfeasance or embezzlement. A term of office may be extended or reduced by action of the legislature unless it be prescribed by constitutional provision or be elective in its nature. Officers of the United States courts hold during good behavior, but those of the territorial courts do not fall within the clause of the constitution already referred to, and depend upon the action of congress for the limitation of their terms. If neither state nor national constitution prescribe the length of a term, the subject is under legislative control, and may be extended or shortened, or the office altogether abolished.

OFFICE, The Divine (Lat. *officium,* duty), is the name popularly given to the canonical hours (q.v.) prescribed to be read each day by bishops, priests, deacons, and subdeacons in the Roman Catholic church. Under the head Breviary will be found a general description of the contents and the arrangement of that great service-book. The special portions assigned for any particular day constitute what is called the divine office for that day; and each person who is bound in virtue of his order to recite the breviary, is obliged, under pain of sin, to read, not merely with the eye, but with distinct, although it may be silent, articulation, each and all these portions. The adjustment of the portions of the office of each day, the combination of the "ordinary" portions which are read every day in common, with the parts "proper" for each particular day, is a matter of considerable difficulty, and is regulated by a complicated system of rubrics (q.v.).

OFFICE COPY is a copy made of a document by some officer of a court in whose custody the document is; and in general such copies are receivable in evidence, without further proof, in the same court, but not in other courts, except some statute makes them evidence.

OFFICE FOUND. See Inquest of Office.

OFFICE, HOLY, Congregation of the. In the article inquisition (q.v.) it has been explained that that tribunal is sometimes called by the name holy office. That title, however, properly belongs to the "congregation" at Rome, to which the direction of the tribunal of the inquisition at Rome is subject. This congregation was established by Paul III. in 1542, and its organization was completed by Sixtus V. It consists of twelve cardinals, a commissary, consulters, and qualifiers, whose duty it is to examine and report on each case for the information of the cardinals. In the most solemn sessions of the holy office the pope himself presides in person. The holy office decides questions of heresy, inquires into crimes against faith, and judges ecclesiastical offenses, especially in the administration of the sacraments. In the present condition of the papal court the action of the holy office is much restricted.

OFFICERS, Military and Naval.—*Military officers* are combatant and non-combatant, the latter term, including paymasters, medical officers, commissariat, and other civil officers. The great divisions of rank are commissioned, warrant, and non-commissioned officers. Commissioned officers are those holding commissions from the crown, or a lord-lieutenant, and comprise all holding the rank of ensign, or corresponding or superior rank. Divided by duties, they are staff officers (see Staff), or regimental officers (see Regiment); divided by rank, general officers (q.v.), field officers (q.v.), and troop or company officers. The last are captains, lieutenants, and sub-lieutenants, and, except in the cavalry, are unmounted. The different systems of promotion for officers, and especially the intricacies of the late purchase system, will be explained under Promotion, Army, and Purchase System. The only warrant officers in the army are master-gunners (see Gunner) and schoolmasters. Non-commissioned officers are described under that heading.

Officers, naval, are commissioned, warrant, and petty officers. Commissioned officers are admirals, captains, commanders, lieutenants, and sub-lieutenants, described under their respective titles. Warrant officers (q.v.) are boatswains, carpenters, gunners, and one class of engineers. Petty officers will be described under that heading, and constitute a very important portion of the management in a ship-of-war.

OFFICIAL ASSIGNEE', in English law, is an offier of the bankruptcy court, in whom a bankrupt's estate vests the moment an adjudication of bankruptcy is made. He is the manager of the property, and can sell the estate under the directions of the court in urgent cases, such as where the goods are perishable; but, in general, he is assisted in the management by the creditor's assignees, who are selected from the body of creditors by the other creditors' votes. The official assignee is appointed by the lord chancellor, being selected from the body of merchants, brokers, or accountants. He is bound to find security to the extent of £6,000. He is prohibited from carrying on trade on his own account. The salary is £1000.

OFFICINAL PLANTS (Lat. *officina,* a shop) are those medicinal plants which have a place in the pharmacopœias of different countries, and which are therefore sold—or some of their products or preparations of them—by apothecaries and druggists. The medicinal plants cultivated to any considerable extent are all officinal, but many are also officinal which are not cultivated. See Medicinal Plants.

OFFSET, or Set-Off, the splay or sloping part of a wall, etc., joining parallel surfaces when the upper face recedes from the lower. This frequently occurs on buttresses. The offset is usually protected with dressed stones, having a projection or drip on the lower edge to prevent the rain from running down the wall.

OFFSETS, a term used by gardeners to designate the young bulbs which, springing from the axils of the scales of a bulb (q.v.), grow beside it, exhausting its strength, but which serve for the propagation of the plant. A crop of shallots, or of potato onions, consists entirely of the offsets of the bulbs planted in spring; although the term is not commonly used except as to bulbous-rooted plants, prized for the beauty of their flowers.

OFFSETS. Let AEF....B....D....C be a field with very irregular sides; take the points A, O, M, C at or as near the corners as convenient, the object being to inclose as much of the field as possible within the quadrilateral AOMC; and for this purpose, it is sometimes necessary, as in the present case, to include a corner (as SRQ) which is outside the field. The area AOCD is found by means of the diagonal AM, and the perpendiculars on it from C and O. The area AEFG....BL is found by dividing it into triangles and trapezoids by means of perpendiculars (to which the term *offsets* was originally applied, though it now denotes the irregular area before mentioned) from the corners E, G, H, etc. (see TRIANGLE and TRAPEZOID), and adding together the areas of the separate figures AEF, FG*g*, GH*gh*, etc. Similarly the areas of OLN....D and MDUW are found. To the sum of these must be added the areas of the triangles ATS, QPC, diminished by the area of SRQ, and the result is the whole area of the field. If the offset have no distinct corners as (fig. 2) ABLMN....OK, then the base AK is divided into equal parts by perpendiculars ABL*l*, M*m*, N*n*, etc., and the area of the offset is found approximately as follows: the whole offset $= ABLl + LlMm + MmNn + \text{etc.} + PpOK = Al \times \frac{1}{2}(AB + Ll) + lm \times \frac{1}{2}(Ll + Mm) + mn \times \frac{1}{2}(Mm + Nn) + \dots + pK \times \frac{1}{2}(pP + OK)$ = (since the divisions of the base are equal) $Al \times \frac{1}{2}\{AB + 2Ll + 2Mm + 2Nn + \dots + 2pP + OK\} = Al \times \left\{\frac{AB + OK}{2} + Ll + Mm + Nn + \dots + Pp\right\}$; i.e., the area of an offset is found approximately by adding the intermediate perpendiculars to the semi-sum of the first and last and multiplying the sum total by the length of a division of the base, the divisions being equal; and the greater the number of perpendiculars, the nearer the result is to the true area.

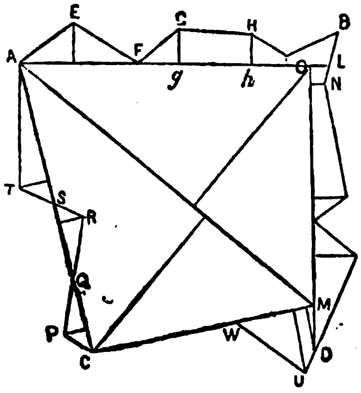


Fig. 1.

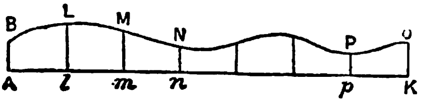


Fig. 2.

OG, an Amoritish king of Bashan. He reigned over 60 cities, of which the chief were Ashtaroth and Edrei, at the time of the entrance of the Israelites into Canaan, B.C. 1618. He and his people were defeated and destroyed at Edrei immediately after the conquest of Sihon, his friend and ally. His walled cities were taken, and his kingdom, with its capital, transferred to the tribes east of the Jordan. He was one of the last of the race of the giants, and Scripture records the size of his iron bedstead preserved in "Rabbath of the children of Ammon," which was about 15 ft. long and 6 broad. This is supposed to have been one of the common flat beds used on the house-tops of eastern cities, but made of iron instead of palm-branches.

OGDEN, a village and co. seat of Weber co., Utah; on the Ogden river at the junction of the Weber river, and having importance as the place of intersection of the Union Pacific, Central Pacific, Utah Northern, and Utah Central railroads; pop. '70, 3,127. There are many machine and car shops, and the place is the center of a country of some agricultural and mining importance.

OGDEN, AARON, LL.D., 1756–1839; b. Elizabethtown, N. J.; educated at Princeton college, where he graduated in 1773. In 1775 while engaged in teaching school he took part in the capture of a vessel containing supplies for the British troops off Sandy Hook. In 1777 he became a captain in the first New Jersey regiment, took part in the battle of Brandywine, and was made aid-de-camp to lord Stirling. In 1779 he was employed in the Indian campaign, and in 1781 commanded a regiment at Yorktown, where his gallantry received the personal commendation of Washington. At the close of the war he practiced law, held several minor offices, was elected United States senator from New Jersey in 1801, and in 1812 was governor of his state. He served in the Mexican war at the head of the New Jersey militia and was offered the rank of major-general, which he declined.

OGDEN, DAVID, 1707-1800; b. N. J., graduated at Yale college, class of 1728; studied law in New York city, rose rapidly in his profession, and attained great distincinto in his native state. He was called one of the "giants of the law." In 1772 he was appointed judge of the supreme court, and inclined toward the opinions of the loyalists during the disturbances preceding the revolution, though disposed to assist in an amicable settlement, and originated a plan for the government of the colonies in case they should submit to the authority of Great Britain. His wavering ending in toryism, his property was confiscated, and in 1776 he removed to New York, joined the refugees, became a member of the board, and in 1783 went to England for a few years, returning to his native land in 1790, and died in Queens co., Long Island. Of his sons, one, Abraham, became a distinguished lawyer and United States district attorney under president Washington, and Isaac was judge of the court of king's bench.

OG'DENSBURG, a city and port of entry in New York, on the south bank of the river St. Lawrence, at the mouth of the Oswegatchie, 210 m. n.w. of Albany, and at the western terminus of the northern railway. It has a large lake and river trade, mills, and factories, custom-house, town-hall, etc., and a steam-ferry to Prescott, Canada. Pop. in 1860, 7,410; in 1870, 10,076.

OGEE', a molding consisting of two curves, one concave and the other convex. It is called (in classic architecture) *cymatium* or *cyma reversa* (see MOULDING). The ogee is also much used in Gothic architecture. An arch having each side formed with two contrasted curves is called an ogee arch.

OGEE'CHEE LIME, *Nyssa capitata*, a small tree; found in Georgia, Alabama, and other southern states. It belongs to the order *cornaceæ*, and takes its name from the fruit, which is small and sour, but edible.

OGEMAW, a co. in n.e. Michigan; watered by Rifle river, on the Mackinaw branch of the Michigan Central railroad; 576 sq.m.; pop., '80, 1914—1156 of American birth. The surface is rolling, and well wooded. Co. seat, West Branch.

O'GHAMS, the name given to the letters or signs of a secret alphabet long in use among the Irish and some other Celtic nations. Neither the origin nor the meaning of the name has been satisfactorily explained.

The alphabet itself is called *bethluisnin*, or *bethluis*, from its first two letters, "*b*," called "*beith*" (birch), and "*l*," called "*luis*" (quicken). Its characters are lines, or groups of lines, deriving their significance from their position on a single stem or chief line—over, under, or through which they are drawn either straight or oblique. In some cases, the edge of the stone or other substance on which the oghams are incised, serves the purpose of the stem or chief line. About eighty different forms of the alphabet are known. Five characters were afterwards added to represent diphthongs. The sign for the diphthong "*ea*" is said to be the only one which has been observed on ancient monuments. It is added that the sign for "*ui*" sometimes stands for "*y*," that the sign for "*ia*" sometimes stands for "*p*," and that the sign for "*ae*" stands also for "*x*," for "*cc*," for "*ch*," for "*ach*," and for "*uch*."

Ogham inscriptions generally begin from the bottom, and are read upward from left to right to the top, when they are carried over, and run down another side or angle. Most of those which have been read give merely a proper name with its patronymic, both in the genitive case. The stones on which oghams are cut would seem, for the most part, to have been sepulchral. Oghams are of most frequent occurrence in Ireland, where they are found both written on books and inscribed on stones, metals, or bone. The oghams on stones are most numerous in the counties of Kerry and Cork. A few ogham inscriptions on stones have been discovered in Wales—as at St. Dogmael's, in Pembrokeshire; near Margam, in Glamorganshire; and near Crickhowel, in Brecknockshire. There are a few in Scotland, as on the Newton stone and the Logie stone in Aberdeenshire, on the Golspie stone in Sutherland, and on the Bressay stone in Shetland. One has been found in England—at Fardel, in Devonshire. Oghams have been observed on an ancient MS. of Priscian, which belonged to the famous Swiss monastery founded in the 7th c. by the Irish missionary St. Gall (q.v.).

The difficulties of deciphering ogham inscriptions cannot be said to have been as yet altogether overcome. It is confessed by the most learned and judicious of ogham scholars, the Rev. Charles Graves, D.D., of Trinity college, Dublin, that the nature of the character is such that it does not at once appear which, of four different ways of reading, is the right one; that the words being written continuously, as in ancient MSS., there is great chance of error in dividing them; and that the Celtic names inscribed are generally Latinized in such a manner as not readily to be recognized.

The old school of Irish antiquaries contended that the oghams were of Persian or Phenician origin, and were in use in Ireland long before the introduction of Christianity. But this theory is now generally discarded, as not only unsupported, but as contradicted by facts. A comparison of the Ogham alphabet with the alphabets of Persepolis and Carthage shows that there is no likeness between them. The great majority of ogham monuments, it has been observed, bear more or less distinct marks of Christian hands.

Several are inscribed with crosses, as old, to all appearance, as the oghams themselves. Many stand in Christian burying-grounds, or beside Christian cells or oratories. Some still bear the names of primitive saints. At least one is inscribed with a Christian name; and some of the inscriptions betray an undeniable knowledge of Latin. At the same time, it has been argued by one of the most learned of Celtic philologists, Mr. Whitely Stokes, that "the circumstance that genuine ogham inscriptions exists both in Ireland and in Wales which present grammatical forms agreeing with those of the Gaulish linguistic monuments, is enough to show that some of the Celts of the islands wrote their language before the 5th c., the time at which Christianity is supposed to have been introduced into Ireland. It has been observed by Dr. Graves, on the other hand, that there are many points of resemblance between the oghams of the Celts and the Runes of the Norsemen; and, indeed, one Irish MS. asserts that the oghams came to Ireland from Scandinavia:

> "Hither was brought, in the sword sheath of Lochlan's king,
> The ogham across the sea. It was his own hand that cut it."

The ogham is said to have been in use so recently as the middle of the 17th c., when it was employed in the correspondence between king Charles I. and the earl of Glamorgan.

The best account of oghams is in the papers in the *Transactions of the Royal Irish Academy*, by Dr. Graves, now bishop of Limerick, vol. iv. pp. 70, 173, 183, 254; vol. v. pp. 234, 401; vol. vi. pp. 71, 209, 248, where also are some papers of value on the same subject by Mr. Samuel Fergusson; and the *Catalogue of the Museum of the Royal Irish Academy*, pp. 134–140; and in Mr. Whitley Stokes's *Three Irish Glossaries*, pp. 55–57, compared with Thomas Innes's *Critical Essay on the Ancient Inhabitants of Scotland*, vol. ii. pp. 440–466. The reader may also consult with advantage Astle's *Origin and Progress of Writing;* Petrie's *Essay on the Round Towers of Ireland;* John Stuart's *Sculptured Stones of Scotland*, and Ware's *Antiquities of Ireland.* Ogham inscriptions may be seen in the museum of the royal Irish academy at Dublin, in the museum of the society of antiquaries of Scotland at Edinburgh, and in the British museum at London.

OGILBY, JOHN, 1600–76; b. Scotland; resided in London. In 1633 he went to Ireland in the employ of Wentworth, earl of Strafford, then deputy of Ireland, pursuing his vocation of copyist and his profession of dancing-master. About 1650 he studied Greek and published a poetical translation of Virgil, 1649–50. He conducted the poetical exercises at the coronation pageant in 1661 which attended the restoration of Charles II. to the throne, and erected a printing-office in the city of London in 1667. Associated with James Shirley, the dramatist, he translated the *Iliad*, 1660; and the *Odyssey* into English verse, 1665, the typography of which was considered very elegant. He translated the works of Montanus, a native of Phrygia, the founder of a Christian sect of the 2d century. His works were splendidly illustrated by Hollar, the Bohemian engraver and designer. It was from his Homer that Pope, in his boyhood, drew the inspiration for his own classical work. In 1670 he published *America, containing the Original of the Inhabitants and the Remarkable Voyages thither*, havin 57 folding plates and maps, exclusive of those inserted in the text, among which is "the earliest view" of Nieue Amsterdam (New York). He was appointed royal cosmographer, and published many maps and geographical works; among them *Atlas Japanensis*, 1670, *Atlas Chinensis* 1671–73, *Britannia*, etc.

OGILBY, JOHN D., D.D., about 1808–51; an Episcopal clergyman, in 1829 became rector of the grammar school of Columbia college, New York, from which institution he had graduated in that year, and held the position 12 months. In 1833 he became professor of languages at Rutgers college, New Brunswick, N. J. He filled the chair of professor of ecclesiastical history in the general theological seminary of the Episcopal church in New York from 1841 to the time of his death, which took place in Paris. He published in 1842 *An Outline of the Argument against the Validity of Lay Baptism;* and in 1844, *The Catholic Church in England and America.*

O'GIVES, the arches in pointed Gothic vaulting which cross the vault diagonally from one angle to another.

OGLE, a co. in n. Illinois, drained by Rock river, Leaf river, and Pine creek; on the Chicago and Northwestern, Chicago and Iowa, and Illinois Central railroads; 750 sq.m.; pop. '80, 29,946—25,432 of American birth. The surface is rolling and the soil fertile with much prairie. The principal productions are corn, wheat, hay, barley, and potatoes. Co. seat, Oregon.

OGLE, BENJAMIN, 1749–1809; b. Md.; member of the Maryland council, and governor of that state 1798–1801.

OGLESBY, RICHARD JAMES; b. Ky., 1824; studied law while living on a farm and working as a carpenter at Decatur, Ill.; and commenced the practice of law at Sullivan in 1845. He was a soldier of the Mexican war, and at the battles of Vera Cruz and Cerro Gordo served as lieut. in the 4th regiment Ill. volunteers. In 1847 he went back to Decatur and the practice of his profession, studying at the same time at the Louisville law school, graduating in 1848. In the gold excitement of 1849 he crossed the continent to the mining districts of California, returned in 1851 to Illinois, went to Decatur and resumed the practice of law. In 1858 he was a defeated candidate for congress, but in 1860 he represented his district in the state senate. When the rebellion broke out in 1861 he resigned his seat to accept the position of col. of the 8th Ill. volunteers, and on March 21, 1862, was promoted to brig.gen. of volunteers for bravery at the battle of fort Donelson, in which action he commanded a brigade. He was in the battle of Shiloh, or Pittsburg Landing, under gen. Grant, and was wounded at the siege of Corinth, where he fought under gens. Halleck and Rosecrans, ending in the defeat of the confederates. He was unfit for duty until the following spring, when he was assigned to the 16th army corps as maj.gen. In May, 1864, he resigned his commission, and in the following November was elected governor of Illinois, and served from 1865 to 1869. In 1872 he was again elected governor, and was U. S. senator 1873–79.

OGLETHORPE, a co. in n.e. Georgia, bounded by Oconee river on the s.w., and Broad river on the n.e.; drained by many creeks; intersected by the Athens branch of the Georgia railroad; 520 sq.m.; pop. '80, 15,400—15,369 of American birth, 9,934 colored. Surface broken and hilly and only moderately fertile; corn, cotton, and pork are the staples. Iron ore and granite are found. Co. seat, Lexington.

OGLETHORPE, JAMES EDWARD, 1696–1785; b. England; entered Oxford in 1714, but soon afterwards accepted a commission in the queen's guards, and went through the Turkish campaign of 1716 as an aid-de-camp of prince Eugene. He participated in the siege of Belgrade, and in 1722 returned to England and entered parliament. Having been appointed a trustee for the relief of insolvent debtors, he conceived a plan for the formation of a colony in America to improve their condition, and to afford a refuge for the persecuted Protestants of Europe. The unsettled country between Florida and South Carolina was selected as a site, and the government made a grant of £10,000. The colony received a charter, and in 1733 Oglethorpe, who was appointed governor, took out a party of colonists to Georgia. For his subsequent connection with the colony, see GEORGIA, *ante*. In 1745 he was made a maj.gen., and after the invasion of the Pretender was ordered to pursue the rebels, and for his failure to overtake them was court-martialed, but acquitted. In 1752 he surrendered the charter of Georgia to the government, and in 1754 he resigned his seat in parliament. He was made lieut.gen. in 1747, and put upon half pay as gen. in 1765. He was offered the command of the British forces in America upon the withdrawal of Gage in 1775. He was eulogized by Pope, by Dr. Johnson, and by Thomson. The *Memoirs of James Oglethorpe*, by Robert Wright, appeared at London in 1867.

O'GOBAI, or OGOWÉ, a large river of western Africa, in the district between the Gaboon and Congo, which falls into the sea by many mouths, between s. lat. 0° 40' and 1° 20'. Its delta is not less than 1800 sq m. in extent, and consists of a most complicated network of channels and creeks, with two main branches, the most northerly of which reaches the sea at Nazareth bay; the other principal mouth, the Bango or Fernand Vaz, about 50 m. further s., has its outlet at the lagoon of Cama or Ncomi. The researches of Du Chaillu, its first explorer, in 1856 and 1865; of Walker in 1866 and 1873; of Compiègne, Marche, and Dr. Lenz in 1874, and in 1875–78 of M. Savorgnan de Brazza and Dr. Ballay, have all helped to increase our knowledge of this region. About 60 m. inland, above the head of the delta, the Ogobai flows for a distance of about 50 m. from the eastward, its average width being about 2,500 yards. It then bends n. for 15 m., and here occurs the junction of the Okanda river, from the n.e., with the Ngunie from the south. The bed of the main stream, the Okanda, is from 800 to 1000 yds. wide above the confluence, with a series of rapids on its upper waters, at a distance of 180 m. from the sea. In addition to a French commercial establishment on the lower river, there is a British and Hamburg station at Adelina Longa, below the Ngunie. This latter district is distinguished by numerous lakes, one of which, 15 m. long by 7 broad, is connected with the Ogobai by three rivers. Lake Azingo, to the n., is connected with the Ogobai by the river Koli. In 1875 M. de Brazza was at Lopé, and explored the Fan country; he then advanced to Doumé, 50 m. s. of the equator, where the course of the river is from the s.e. to the n.w. Interrupted by illness, he resumed his explorations in April, 1877, advancing to the Poubara falls, in 1° 45' s., where the Ogobai becomes an insignificant stream. Traveling eastward into unknown country, he crossed the water-parting, and discovered the Alima, a hitherto unknown river, which he found to be 150 yards wide, flowing eastward, and in all probability a tributary of the Congo. The region between the Ogobai and Alima is 50 m. across, and consists of hills of moderate height, with easy passes. The dense forests of the Ogobai are the main haunts of the gorilla (q.v.), and of several other anthropoid apes, amongst which are the nest-building apes (q.v.). S. of the Ogobai dwell the Ashira and Apingi tribes, the latter being skillful weavers, though cannibals; between the Ogobai and the Gaboon are the Fans, first fully described by Du Chaillu, who are also cannibals, and have been moving westwards for some years, so that the whole Gaboon region is occupied by them. The Fans excel in smith-work, but they have deteriorated since their contact with the whites. Next in importance to the Fans are the Bakalai, inhabiting the country around the confluence of the Ogobai and the Ngunie. Amongst the other tribes on the upper waters are the Okota, Osyeba (cannibals), and the Okanda. The rise of the Ogobai corresponds with the heaviest rainfall, which takes place in March and April, and again in October and November. Inland, rain is more frequent than at the coast. The Ogobai seems to gather most of its volume from lands comparatively near the coast, and not to depend greatly on more remote tributaries.

OGY'GES, the earliest king of Attica and Bœotia named in Greek legend. In his time (according to Larcher, about 1759 B.C.) a great flood took place, called the Ogygian flood, which desolated all the lower districts of both countries, and destroyed their inhabitants. The different legends lead to the supposition that under Ogyges an Egyptian colony came to Bœotia, and thence to Attica. From him Bœotia took the name of Ogygia.

OGY'GIA, a genus of trilobites peculiar to the Llandeilo flags of the lower Silurian period. Six species have been described.

OHIO, one of the United States, lies between lat. 38° 17' to 41° 54' n., and long. 80° 34' to 84° 40' w.; 225 m. in extent from e. to w., and nearly 200 m. from n. to s.; containing 39,964 sq.m., or 25,576,960 acres; bounded n. by Michigan and lake Erie, e. by Pennsylvania and Virginia, from which it is separated by the Ohio river, which also forms its southern-boundary, separating it from Virginia and Kentucky, and w. by Indiana. The Ohio river forms its boundary for 436 m., and its lake shore is 230 miles. The high table-lands hilly, and in parts mountainous regions of Ohio, are drained by numerous rivers, among which are the Great and Little Miami, Sciota, and Muskingum, affluents of the Ohio; and the Maumee, Sandusky, Huron, Vermillion, Cuyahoga, and Ashtabula, which empty into lake Erie. Drift formations prevail in the n., alluvium in the s., with extensive coal-measures, and limestone strata, shales, marls, and gypsum, giving the whole state a wonderful fertility. The coal-beds of eastern Ohio cover 10,000 sq.m., with abundant deposits of iron ore. In the n. are valuable deposits of buhrstone, a fossiliferous flinty quartz, used for millstones. The salt produced in 1873 was reported at 4,154,187 bushels. Oil wells have also been opened, and 1,315,660 barrels of oil were refined in the state in 1873. The soil, rich everywhere, is so fertile in the river bottoms as to have borne heavy cereal crops 50 successive years without manuring; the climate is temperate, with a liability to a cold in winter reaching sometimes to 20° below zero. It is healthy, except lowlands liable to fever and ague. The forests are rich in oak, black walnut, maple, etc.; the chief agricultural productions are Indian corn, wheat, rye, oats, hay, sorghum, tobacco, hemp, peaches, apples, grapes, cattle, sheep, swine, the latter being one of its chief exports. The chief manufactures are iron, clothing, furniture, spirits, wines, cotton, and woolen. The wine called Catawba, produced upon the southern shore of lake Erie, compares very favorably with the similar wines of the Rhine. Farms occupy 21,712,420 acres, with an average size of 111 acres. A large commerce is carried on by the Ohio river, the lakes, canals, and numerous railways. The state is organized in 88 counties. The chief towns are Cincinnati, Cleveland, Columbus (the capital), Sandusky, Zanesville, etc. In 1874 there were 170 national and 248 private and other banks. The state revenue in the year ending Nov. 15, 1874, amounted to $5,768,789. Among the state institutions are 4 lunatic asylums, asylums for deaf and dumb, blind, idiots, penitentiary, reformatories, etc. In 1870 there were 11,952 establishments for education, including 9 universities, 33 colleges, 11 theological institutions, 10 medical, and 11,458 public schools. The total attendance was 790,795. The state possesses many extensive libraries, and has 395 newspapers. In 1874, 4,374 m. of railway were open for traffic.

Ohio was organized and admitted as a state in 1803. The pop. in 1800 was 45,365; '20, 581,434; '40, 1,519,467; '60, 2,339,599, of whom 111,257 were Germans, 51,562 Irish, 36,000 English and Scotch; '70, 2,675,468.

OHIO (*ante*). *History.*—The cavalier de La Salle is the first white traveler of record on the soil of Ohio. His journey to discover the Ohio river was made in the winter and spring of 1669–70. See OHIO RIVER. No settlement followed that discovery for a hundred years. The whole territory w. of the Alleghanies was claimed alike by the English and the French, and each made it dangerous for the other to form any permanent settlements. The treaty between those powers in 1763 ceded the territory s. of the lakes to England. The English col. Boquet traversed the state with a military expedition against the Indians in 1764. The colony of Virginia claimed the whole n.w. territory ceded by France under grants from the crown. But Connecticut, New York, and other colonies, also claimed an interest in the same country by conflicting grants. Virginia patriotically ceded her claim to the general government in 1787. Connecticut obtained a recognition of her claim in a compromise by which a tract was set off to her on the s. side of lake Erie containing 3,666,921 acres, known as the "Western Reserve" or "New Connecticut." In 1800 Connecticut relinquished her jurisdiction over the domain, but retained the title to the land and sold it through her own agents. Congress assumed jurisdiction over the north-west territory in 1787. In 1786 a company was organized in Boston under the lead of gen. Rufus Putnam, to buy a large tract in Ohio for colonization; but before the colony started they secured a grant of land from congress; other companies secured similar grants; and members of congress were largely interested in them. The lands so granted amounted to 5,000,000 acres, of which gen. Putnam's party, known as "the

Ohio company," were authorized to locate 1,500,000 acres. They selected lands injudiciously near the mouth of the Muskingum river. In April, 1878, a company of New England people, representing some of the most educated and estimable families, were conducted to that locality and founded the town of Marietta, so named in compliment to Marie Antoinette, queen of our French ally. A similar settlement was made at Cincinnati the autumn of the same year; and a few years later migrations from the leading social and industrial society of the eastern states settled in the western reserve. The Indians, however, were not dispossessed of their rights, and were much feared until the victories of gen. Wayne over them in 1794 at Tippecanoe in Indiana, and at Presque isle on the Maumee river. From that time forward emigration surged over the territory. It established a territorial government in 1800; adopted a state constitution, and was admitted into the union as a state in 1802. Chillicothe was the capital, 1800–10; Zanesville from 1810 to 1812; Chillicothe again from 1812 to 1816, when Columbus became, and remains, the seat of government.

North-western Ohio was the theater of some events of the war with England in 1812–15. Col. Croghan made a brilliant defense of a rude fort at Sandusky; gen. Harrison maintained fort Meigs, on the Maumee, against a combined force of British and their Indian allies under Tecumseh; and lieut., afterwards commodore Perry, won a brilliant naval victory at the w. end of lake Erie over a British fleet which came down from Detroit to attack him. From that time to the present the progress of the state in population and towards a high average condition of comfort for all the people has been nobler than any of the more exciting events of war. Yet the people during the war of the rebellion, 1861–65, illustrated how "the peaceful ever are the strong" by sending into the field promptly as they were called, and always thoroughly equipped, 810,000 men; and furnishing a large proportion of the most successful generals. The state has since inherited from Virginia the title of "the mother of presidents."

The following table shows the population of the state from the time it took a territorial government to the present:

YEAR.	White—Native and Foreign.	Colored.	Irish and British Isles.	German Countries.	All other foreign born.	Total.	Rank among states.
1800	45,028	337	....	....	... ...	45,365	18
1810	228,861	1,899	....	....	....	230,760	13
1820	576,572	4,723	....	....	....	581,295	5
1830	928,329	9,574	....	....	....	937,903	4
1840	1,502,122	17,345	....	....	....	1,519,467	3
1850	1,750,746	25,279	....	....	....	1,980,329	3
1860	2,011,262	36,673	116,061	168,210	43,963	2,339,511	3
1870	2,292,767	62,867	140,028	182,897	49,568	2,665,260	3
1880	3,118,344	79,805	....	....	....	3,198,239	3

The cities of Ohio which show a population of upwards of 10,000 by the census of 1880 are: Cincinnati, 255,708; Cleveland, 160,142; Columbus, 51,665; Toledo, 50,143; Dayton, 38,677; Springfield, 20,729; Zanesville, 18,120; Akron, 16,511; Sandusky, 15,838; Youngstown, 15,431; Canton, 12,258; Hamilton, 12,122; Steubenville, 12,093; Portsmouth, 11,814; Chillicothe, 10,938.

The population of the counties of the state by the census of 1880 is, as far as received:

COUNTIES.	Population.	COUNTIES.	Population.
Adams	24,004	Mercer	21,808
Allen	31,323	Monroe	26,497
Ashtabula	37,139	Montgomery	78,545
Athens	28,418	Morgan	20,074
Belmont	49,638	Muskingum	49,780
Butler	42,580	Noble	21,137
Clermont	36,718	Ottawa	19,763
Coshocton	26,641	Paulding	13,490
Cuyahoga	196,943	Perry	28,218
Defiance	22,518	Pike	17,927
Franklin	86,816	Preble	24,534
Fulton	21,062	Putnam	23,718
Gallia	28,124	Richland	36,306
Greene	31,349	Ross	40,307
Guernsey	27.197	Sandusky	32,063
Hamilton	313,368	Sciota	33,511
Hancock	27,788	Seneca	36,955
Harrison	20,455	Shelby	24,136
Henry	20,587	Stark	64,027
Highland	30,280	Van Wert	23,030
Hocking	21,126	Vinton	17.226
Jackson	23,679	Warren	28,392
Jefferson	33,018	Washington	43,244
Lawrence	39,068	Williams	23,821
Lucas	67,388	Wood	34,026
Meigs	32,325	Wyandot	22,401

Topography.—Lake Erie on the n. is 580 ft. above the level of the sea. The Ohio river, which forms the entire s.e. and s. boundary of the state, descends from an elevation of a little less than 1000 ft. where it leaves Pennsylvania and strikes the e. line of Ohio, and falls 600 ft. in the 486 m. of its course around the state to the Indiana line. The drainage divide of the state is about one-third of the distance from the n. to the s., so that about one-third of the state drains into the lake and two-thirds into the Ohio river. The summit level or dividing ridge runs from Trumbull co. in the n.e. to Mercer and Darke counties in the s.w., with an average altitude of less than 600 ft. above the lake. The state has, therefore, a general plane of descent from the n.e. to s.w.; he exception being the n.w. counties which rise on a gentle plane of ascent w. from the lake, into which they drain, through the Maumee river. The state has no mountains. Its greatest local elevation is in Logan co. near the middle of the western half of the state, 1540 ft. above the sea. The hilly or rolling surface of a large part of the Ohio river water-shed and the rounded bluffs that margin the large rivers are the remains of the great erosions by water of the original geologic plateaus. The Ohio river has worn its bed in many parts from 500 to 600 ft. below the hilly summits along its valley, and its tributaries have worn similar though less deep valleys. The main streams flowing into lake Erie, beginning at the e., are: the Cuyahoga river, emptying at Cleveland and forming its harbor; the Black river. 30 m. w.; the Vermillion, 12 m. farther; the Huron, 12 m. from it; the Sandusky, emptying into Sandusky bay; the Ottawa, emptying at Port Clinton; and the Maumee into Maumee bay. All of them have harbors at their mouths. Of these lake streams the Maumee drains much the largest country. The rivers flowing into the Ohio are the Muskingum, emptying at Marietta; the Hocking; the Sciota, having Portsmouth at its mouth; the Little Miami, emptying 6 m. above Cincinnati; and the Miami proper, or Big Miami, joining the Ohio about 20 m. below Cincinnati. All these river valleys are beautiful and fertile throughout; but growing richer in soil relatively from the e. westwardly; the two Miamis being the richest valleys on the Ohio slope; and the Maumee, the Portage, and the Sandusky, the streams flowing through the richest soils to the lake. Toledo, Sandusky, and Cleveland are the main lake ports. The low divide between the Cuyahoga and the Muskingum rivers early suggested the Ohio canal from Cleveland to Marietta. The still lower divide between the estuary of the Maumee and the Miami river led to the construction of the Miami and Erie canal, 247 m. long, from Toledo to Cincinnati, finished in 1839. The Ohio river, notwithstanding an average descent of $\frac{71}{100}$ ft. to the m., is navigable its entire distance along the state for steamers of considerable size at high stages of the water, and for barges at all stages. See Ohio River. The lake shores indicate either a subsidence of the waters or a lifting of the land, as there are several old beaches or ridges that mark old water lines of the lake, now respectively from 100 to 250 ft. above its present level.

Geology.—The geological structure of the state is simple and varies little from the horizontal. Its surface is an erosion of the paleozoic system. There is no show of granite at the surface in the state. The carboniferous, Devonian, and Silurian systems form the surface-rock geology of the state. The quaternary or drift deposits cover a large part of the state, the lowest or first of these being the unstratified blue clay known as bowlder clay; the later deposit a laminate clay called by geologists the Erie clay; and above that vegetable deposits of varied character. The formation of the quaternary deposits is believed to have been going on during remote periods, during which not only alterations of the surface of prior formations were going on by elevation and subsidence, but the climate was varying radically at different periods, the region being at one time under glacial action, and at another under a climate warmer than now. The bowlder blue clay is the deposit of the glacial period. The carboniferous system embraces about one-third of the state, beginning near Portsmouth on the Ohio river for its easterly line of outcrop, and taking a n.n.e. direction to near lake Erie; overlying the Devonian system which geologically forms the surface of the n.e. and n.w. portions of the state. The Cuyahoga shales, Berea grit, and other Ohio sandstones, from near the lake, belong to the Waverly or lowest group of the Devonian stratification. Limestone and conglomerate formations are shown in the outcrops of the w. parts of the state. The whole of the s.e. half is underlaid with the coal-bearing formations; and the geological surveys show seven distinct veins of coal of superior quality for domestic use or for making gas and smelting iron. The aggregate thickness of the coal beds which are convenient to work upon is about 50 feet. The outcrop of the coal is along the margins of an irregular belt reaching from Mahoning co. in the n.e. to the Ohio river in the s.; the two extremities of the belt being the most prolific in coal easily quarried, and the beds in the Hocking river valley being considered the great vein coal region of Ohio. The e. outcrop of the coal basin is seen along the Ohio river for hundreds of miles, where tunnels on the coal veins are run directly into the hills from the river slope. The most marked feature in the basic geology of Ohio is what prof. J. S. Newbery terms the Cincinnati arch, which he describes as "a great fold of the strata raised at the close of the lower Silurian age, when it formed two islands, one in Tennessee, the other in Kentucky and Ohio, around which the more recent rocks were deposited on a sloping shore. . . . In the coal-measure epoch, the Cincinnati arch was apparently a land area throughout its entire length, its northern end being then as now its highest portion, and connected with the highlands of

Canada," as shown "by the manner in which the coal-measure strata terminate on the western margin of the basin in Knox and Richland counties, where the coal-beds abut against pre-existent Waverly sandstone hills." The sandstones w. of Cleveland, n.w. of the coal belt, form a great export of Ohio, and are used in all the cities of the northern states and Canada for elegant buildings; also for grindstones.

Minerals.—Besides the coal fields already alluded to under the head of geology, iron ore of good quality has been found over an area embracing nearly one-third of the state, mostly in the e. and s. portion, along the s.e. margin of the great coal belt. Blackband ore is found in n.e. Ohio, and extensively used in the iron establishments of Cleveland, Massillon, Dover, and Port Washington, where they are mixed with other ores. The amount of iron ore mined exceeds 600,000 tons. Salt is made in considerable quantities from salt-springs, the product in 1873 being 1,400,000 barrels. Petroleum has been raised from oil wells in the eastern part of the state to the amount of 1,500,000 galls. a year. Lime for building purposes, both quick and hydraulic, is an extensive manufacture, and largely exported.

Climate.—Like all the northern United States Ohio has a wide range of temperature, running from a tropical heat during a short summer term to an Arctic cold occasionally in winter. The difference between the n. and s. parts of the state is what would be expected from the difference of latitude and a slight difference in elevation; the n.e. part of the state, which is the highest in latitude and altitude, being the coldest in winter and summer; and the s.w., at Cincinnati, proportionally warmer. The shores of lake Erie are noted for their cooling breezes in July and August; receiving a land breeze in the morning, and a lake breeze in the afternoon. In spring, however, they are visited by winds blowing over ice fields floating down from the upper lakes, which chill the air in April and May, when the interior of the state has the most genial temperature.

Below is given the ranges of temperature at representative points in the state: Cleveland and Toledo being on or near the lake, Portsmouth and Cincinnati the s. points on the Ohio river, and Massillon representing the interior, on the divide s. of Cleveland. The latitude of each is given:

Temperature, mean, and of each season, and rainfall.	Cleveland. 41° 30′	Toledo. 41° 40′	Massillon. 40° 70′	Portsmouth. 38° 45′	Cincinnati. 39° 06′
Mean temperature of the year.	45° 87	49° 55	52° 06	55° 83	51° 37
Highest " " " "	96.	100.	99.	104.	103.
Lowest " " " "	—8.	—16.	—8.	8.	6.
Range " " " "	114.	116.	97.	96.	97.
Mean temperature of spring.....	44.39	44.17	47.12	55.71	51.59
Highest " " "	86.	83.	86.	96.	94.
Lowest " " "	15.	15.	15.	23.	19.
Range " " "	71.	73.	71.	73.	75.
Mean temperature of summer...	70.52	71.99	72.92	78.	77.50
Highest " " "	96.	100.	99.	104.	103.
Lowest " " "	44.	44.	50.51	59.	56.
Range " " "	52.	56.	48.49	45.	47.
Mean temperature of autumn....	53.06	51.27	55.23	57.95	56.53
Highest " " "	87.	90.	83.	93.	92.
Lowest " " "	17.	11.	25.	17.	14.
Range " " "	70.	79.	58.	76.	78.
Mean temperature of winter.....	31.08	26.99	32.99	40.81	35.33
Highest " " "	66.	63.	62.50	70.	69.
Lowest " " "	—8.	—16.	—8.	8.	6.
Range " " "	74.	79.	70.50	62.	63.
	inches.	inches.	inches.	inches.	inches.
Mean annual rainfall.............	38.43	38.64	32.44	38.32	36.49
Rainfall of spring....	6.65	11.78	7.22	9.18	9.41
" " summer.	10.24	10.87	9.15	11.62	8.77
" " autumn..............	10.24	9.72	6.30	6.88	7.99
" " winter................	11.30	6.27	9.77	11.14	10.33

All portions of the state are healthful at present, though there was scarcely a part where malarious diseases were not prevalent in the settlement of the country, and particularly in the valleys of the streams flowing into the Ohio and the w. end of lake Erie, where those ailments are now extremely rare.

Productions.—There is probably no state of the union with less waste land than Ohio. The broken hills of the s.e., particularly noted for their products of coal and iron, are the least, and the central and w. the most, fertile. Every production of the temperate zone may be cultivated in some portion of the state, and every species of domestic animal is as profitable there as elsewhere. More than a fifth of the entire wool crop of the United States was produced in this state in 1870; nearly two-thirds of the flax; and of milk, butter, and cheese, only the state of New York produces more, or exceeds Ohio in the value of its farms per acre. The n.e. part of the state, known as the Western Reserve, or New Connecticut, is the most noted dairy region; the lake borders the most valued for fruit, especially grapes; the southern part for stock; and the w. and s.w. for corn; yet all portions grow pretty nearly the same crops, with a slight difference of adaptability.

Vegetable Products.		1870.	1879.
Wheat,	bushels	27,882,159	35,218,773
Rye,	"	846,890	756,502
Indian Corn,	"	67,501,144	114,839,127
Oats,	"	25,347,549	29,671,231
Barley	"	1,714,221	1,265,299
Buckwheat,	"	180,341	....
Irish Potatoes,	"	11,192,814	7,580,118
Sweet "	"	230,295	....
Peas and Beans,	"	45,443	....
Apples,	"	11,012,582	30,669,404
Peaches,	"	309,639	1,476,159
Pears,	"	67,047	110,419
Clover-seed,	"	103,355	....

Vegetable Products.		1870.	1879.
Flax-seed,	bushels	631,894	474,669
Grass-seed,	"	48,811	....
Hay, tons		2,289,565	2,290,473
Hops,	lbs	101,236	....
Tobacco,	"	18,741,973	28,075,140
Maple Sugar,	"	3,469,128	....
Grapes,	"	15,853,719	....
Domestic Wines,	gallons	2,577,907	....
Sorghum and Maple Molasses,	galls.	2,376,039	1,783,165
Sugar—sorghum		....	11,909
" maple		....	2,987,288

Farm Stock.		1870.	1879.
Horses	numbers	704,604	730,642
Mules and Asses	"	16,065	26,793
Cows	"	651,390	1,680,000
Oxen	"	23,606	
Other Cattle	"	758,221	
Sheep	"	4,928,635	4,967,261
Swine	"	1,728,968	2,041,649

Products of Farm Stock.		1870.	1879.
Milk sold	gallons	22,275,344	....
Butter	pounds	50,266,372	50,332,023
Cheese	"	8,169,486	36,401,386
Wool	"	20,539,643	16,390,505
Eggs	"	....	....
Honey	"	763,124	2,521,293
Beeswax (See PACKING.)	"	22,488	....

The total value of farms in the state in 1870 was $1,054,465,226; of farming implements and machinery, $25,692,787; of all farm products, $198,256,907. The census return of 1880 will probably show a large increase in farm products, with but a small increase in farm valuations. The average product per acre in 1870 was, of wheat, 13.27 bush.; corn, 36.67 bush.; oats, 32.69 bush.; rye, 11.5 bush.; barley, 23.89 bush.; potatoes, 87 bush.; sweet potatoes, 77 bush.; hay, 1.05 tons; tobacco, 1253 lbs.

The fisheries of the state produce an important element of its commerce. Those conducted on a considerable scale are at the w. end of lake Erie, between the islands and the main-land for white fish, and in the Sandusky and Maumee bays and their tributaries for pickerel, bass, mullet, cat-fish, and muskallonge. The annual out-put from the fisheries of the lake and its rivers exceeds $1,500,000 of value. They are packed principally at Toledo and Sandusky for export, and are consumed in the interior.

Manufactures.—In 1870 Ohio ranked fourth among the states in the capital employed in manufacturing and in the value of manufactured products; first, in the value of woodenware, and second to Illinois in the making of agricultural implements. The census of 1880 may place this state at the head of the world in the latter industry. In iron-works Ohio ranked next to Pennsylvania and New York. The number of establishments that year was 22,773. employing upwards of 137,202 hands, of whom 119,686 were men, 11,575 women, and 5,941 boys and girls under 15 years of age. They used 4,586 steam engines, aggregating 129,577 horse-power, and 2,157 water-wheels, of 44,746 horse-power. The capital engaged was $141,923,964; the wages paid per year, $49,066,488; cost of raw materials, $157,131,697; and value of products, $269,713,610. The great business of all new and flourishing states—the manufacture of houses—does not enter specifically into the list of manufactures, and is not given fully or even approximately under the several heads of figures opposite to carpentering and building, brick, lumber, etc. The following table shows, otherwise, the main manufacturing interests of the state in 1870:

INDUSTRIES.	Number of Factories.	Steam Horse-Power.	Water Horse-Power.	Hands Employed.	Capital.	Wages.	Value of Materials.	Value of Products.
Agricultural Impl'ts.	219	3,581	283	5,124	$7,570,320	$2,841,518	$5,240,550	$11,907,366
Blacksmithing	2,406	45	....	4,270	1,089,692	518,122	938,602	3,099,476
Boots and Shoes	2,358	48	....	6,738	2,058,067	1,747,810	2,884,261	6,559,946
Bread and Bakery Products	279	250	....	975	495,522	284,582	1,288,604	2,202,818
Brick	331	516	8	2,409	633,660	462,758	294,420	1,252,857
Carpentry and Building	1,613	300	....	4,924	1,086,777	1,481,134	3,277,849	6,806,658
Carriages and Wagons	1,221	231	28	5,094	2,964,783	1,671,070	1,537,164	5,049,580
Cars, Fr't and Pass'r.	11	465	....	1,462	1,355,970	917,565	1,865,679	2,555,855
Cheese	195	317	40	759	474,970	116,685	1,875,711	2,287,804
Clothing, men's	773	.....	....	10,682	4,696,727	2,436,829	7,496,501	12,367,440
Coal Oil, rectified	25	385	....	270	737,000	157,859	4,496,168	5,888,473
Cooperage	658	963	50	3,206	1,108,957	1,105,530	1,729,417	3,554,171
Flouring Mills	1,396	18,834	26,564	3,932	11,834,952	965,724	26,498,777	31,692,210
Furniture	613	2,874	241	6,271	5,615,065	2,489,042	2,158,565	6,792,585
Hubs and Wagon Materials	58	1,698	145	1,301	1,308,450	548,647	665,190	1,712,208
Iron, rolled and forg'd	38	11,186	100	4,670	6,686,659	2,791,560	8,435,585	13,033,165
" nails and spikes.	10	1,477	....	870	841,241	198,140	1,807,402	2,097,848
" pig	65	10,158	....	4,582	7,487,826	2,085,520	7,056,405	10,956,958
" castings, not specified	215	2,858	453	3,078	5,656,879	1,757,300	3,569,086	7,318,102
Iron, stoves, heaters, hollow-ware	53	968	82	1,987	2,616,750	1,100,866	1,195,424	3,221,289
Leather, tanned	495	1,622	94	1,265	2,171,108	379,178	2,768,493	3,714,232
" curried	387	210	....	796	1,057,733	251,418	2,933,218	3,522,100
Liquors, distilled	63	2,710	205	735	2,829,700	369,967	4,371,289	7,022,656
" malt	190	1,257	4	1,305	5,337,272	748,540	2,711,270	5,753,666
" vinous	38	.....	....	124	369,900	25,300	179,775	309,375
Lumber, planed	142	2,883	95	1,095	1,212,902	491,268	1,599,615	2,519,745
" sawed	2,228	36,698	9,690	8,825	6,188,179	1,584,759	4,918,328	10,102,780
Machinery, not specified	142	1,750	528	2,254	3,395,885	1,244,973	1,880,596	4,196,912
Machinery, railroad repairing	13	732	....	1,862	2,447,284	1,117,110	1,130,389	2,248,149
Machinery, steam engines and boilers	72	1,265	20	2,811	2,826,120	1,801,649	2,656,409	4,801,341
Malt	34	189	30	166	965,228	75,301	943,818	1,129,695
Marble and Stone, general	79	1,010	70	927	1,085,125	410,396	439,674	1,012,072
Monum'ts and Tombstones	118	172	....	677	661,445	278,590	502,865	1,108,951
Meats, packed	58	106	....	330	3,792,490	341,964	9,870,626	10,655,950
Oils, animal	11	108	....	148	501,000	71,822	1,553,186	1,702,343
" linseed	23	366	277	202	1,090,967	76,500	1,537,290	1,840,000
Paper, printing	17	1,288	819	785	1,604,800	306,278	1,511,545	2,219,840
" wrapping	20	383	965	368	876,000	144,776	792,064	1,224,253
Patent Medicines, etc.	17	16	....		417,400	68,780	269,442	1,004,200
Printing and Publishing	43	425	....	184	1,768,400	948,521	953,444	2,896,720
Saddlery and Harness	787	.....	....	1,488	832,328	419,097	992,922	2,074,258
Salt	40	849	40	1,999	1,085,904	161,420	862,922	778,492
Sash, doors and blinds	142	3,423	250	437	2,428,523	949,374	1,730,236	3,416,998
Soap and Candles	42	267	....	2,078	1,085,150	166,518	2,337,625	2,976,544
Stone and Earth'ware	170	482	19	407	751,700	417,508	250,070	970,749
Tin, Copper, & Sheet Iron	652	77	...	1,244 2,313	1,598,433	711,421	1,458,534	3,214,285
Tobacco, chewing, smok'g and snuffing	406	6	....	2,499	826,369	769,987	978,174	2,666,188
Woolen Goods	191	2,689	1,873	2,169	2,962,169	544,630	1,895,622	3,187,815

The coal and iron mining in the state in 1870 was represented by 535 companies, employing 11,241 men and 4,143 horse-power in steam engines. The capital invested was $9,017,197, and the product of that year was valued at $7,751,544. The out-put of all the coal mines has greatly increased since that time, especially those of the Hocking valley coal fields, which have been opened up to a vast market n. and w. by the completion of railroads to the lake at Toledo and Sandusky, crossing all the e. and w. railroads. The production of pig iron in 1872 was 399,743 tons; about one-seventh the whole product in the United States. Lawrence and Jackson counties lead in the production of these ores. The number of smelting stacks was about 1000. In 1873 there were 44 rolling mills, of which 15 were making railway iron; 4, Bessemer steel rails; and 7, other kinds of steel. The refinement of petroleum oil, which amounted in 1873 to 1,315,660 galls., has since swelled to far greater proportions; and the manufacture of quick-lime, and water-lime cement, has become a great industry. Pork and other meat-packing has become, by the appliances of machinery to the work, one of the manufactures of the country. Ohio formerly outranked all the other states in the packing business, but is now second to Illinois. The records of the packing season of 1874–75 for Ohio show 871,736 hogs cut up, making 241,737,547 lbs. The lard product was 35,459,594 lbs.

Total value of the hogs packed, $16,597,490. Bacon, 465,075,171 lbs.; hams, 162,776,309 lbs.; shoulders, 186,030,068 lbs. See CINCINNATI.

Commerce.—Ohio has three U. S. customs districts, of which the ports of entry are Toledo, Sandusky, and Cleveland, and Cincinnati is a port of entry in the district of Louisiana for the state of Ohio. These customs ports represent only the foreign imports and exports, which the position of Ohio on the lakes, adjoining Canada, and in communication with ocean commerce through the Canadian canals and the St. Lawrence, enables her merchants to make direct to and from foreign countries. The same may be said of Cincinnati, though its foreign trade must be done much more indirectly through the Ohio and Mississippi rivers. The foreign commerce of Ohio is, however, insignificant compared with the vast domestic commerce e., w., n., and s., along her lakes, railways, canals, and great river. Lake Erie is still the greatest single highway of commerce for the state.

Formerly the canals were expected to be second only to the lake and the Ohio river in volume of commerce, but the railways have far surpassed them in carrying facilities, so that the great value of the former is now to secure low rates on the railways by their always cheaper, though slower, transportation. There are 690 m. of canal in the state, including 86 m. of feeders and side cuts, besides 95 m. of slack-water navigation on the Muskingum river from Marietta to Dresden. The Ohio canal, between Cleveland and Portsmouth on the Ohio, and with its 22 m. of feeders, is 331 m. long. The Miami and Erie canal, from Toledo to Cincinnati, is 246 m. long, with—

Wabash feeder to Indiana state line	18 miles.
Sidney feeder	14 "
St. Mary's reservoir	11 "
Walhonding to Rochester	25 "
Hocking, Carroll to Athens	56 "
Total	360 miles.

The "Wabash feeder," as it is listed above, is really the main line of the Wabash canal, extending from Toledo s.w. into Indiana, a distance of 422 miles. The Miami and Erie being the first chartered, the Wabash merges its name from the junction down to Toledo. The Wabash canal, when it was finished in 1844, was the longest continuous canal in the world. The business still transacted on all these canals is very great. On the Ohio canal it has become principally of coal, iron ore, and bulky farm products; on the Wabash and Miami and Erie canals, it is principally in corn, wheat, provisions, and lumber, with a large business also in heavy merchandise, coal, iron, ice, etc.

Railroads.—About 60 different lines of railway form a net-work in every direction through the state, making about 7,000 m. in length, without counting double or more than double tracks. The following table gives the names of all the railway companies doing business in Ohio, many of them wholly in the state, and others parts of long lines which traverse the state mostly from e. to w.; also, the assessed values upon which such roads so lying within the state were taxed in 1879:

NAMES OF RAILROADS AND CORPORATIONS.	State Valuations, 1879.
Ashtabula, Youngstown and Pittsburg	$608,697
Atlantic and Great Western	3,180,296
" " " " Agent U. S. Rolling Stock Co.	76,096
" " " " Cleveland and Mt. Vernon Division	1,707,674
" " " " C. and M. V. Div'n, Agt. U. S. Rolling Stock Co.	183,021
Baltimore and Ohio, Central Ohio Division	1,858,058
" " " Straitsville Division	434,016
" " " Lake Erie Division	1,421,925
" " " Washington County Division	15,516
" " " and Chicago	1,835,578
Bellaire and St. Clairsville, Narrow Gauge	11,920
" " Southwestern, " "	22,275
Bowling Green, " "	12,000
Bridgeport, Canton and Painesville	11,750
Brown, Bonnell & Co	3,000
Brooks's Switch	4,832
Cincinnati, Hamilton and Dayton	1,636,083
" " " Indiana	364,308
" Richmond and Chicago	350,583
" Hamilton and Indianapolis	202,205
" Sandusky and Cleveland	1,484,555
" and Springfield	1,232,668
" " Eastern, Narrow Gauge	139,131
" " College Hill " "	15,708
" " Westwood " "	16,295
" Inclined Plane (fixed power)	49,235

NAMES OF RAILROADS AND CORPORATIONS.	State Valuations, 1879.
Cincinnati and Clifton Inclined Plane (fixed power)	38,980
“ Southern	1,614
“ and Portsmouth	55,070
“ “ Milford	2,350
Chicago and Canada Southern	56,500
Cleveland, Columbus, Cincinnati and Indianapolis	6,771,756
“ Mt. Vernon and Columbus	1,108,769
“ and Pittsburg	5,273.269
“ Tuscarawas Valley and Wheeling	895,074
Columbus and Maysville	28,688
“ “ Hocking Valley	1,634,412
“ Springfield and Cincinnati	476.421
“ and Toledo	1,243.660
“ Washington and Cincinnati	27,164
Dayton and Michigan	1,947,374
“ “ Union	293,940
“ “ Southeastern, Narrow Gauge	220,495
Eastern Ohio	10,400
Gallipolis and Columbus	2,000
Harrison Branch	14,244
Hayden's Switch	47,136
Hazleton and Leetonia	10,000
Iron	141,860
Lake Erie, Alliance and Wheeling	28,900
“ “ and Louisville	326.185
“ Shore and Michigan Southern	18,114,641
“ View and Collamer	7,000
Little Miami, Cincinnati and Indiana	8,000
Mahoning Coal	354,905
Marietta and Cincinnati	2,844,255
“ Pittsburg and Cleveland	234,046
Miami Valley, Narrow Gauge	8,200
Mt. Adams and Eden Park Inclined (fixed power)	40,420
Northwestern Ohio	788,053
Ohio Central	73,200
Ohio and Mississippi	219,592
Ohio and Toledo (no valuation)	....
Painesville and Youngstown	175,779
Paulding and Cecil	4,900
Pittsburg, Cincinnati and St. Louis	2,721.639
“ “ “ “ Little Miami Division	2,882,810
“ “ “ “ C. C. and I. C. Division	2,251,800
“ “ “ “ C. C. and M. V. “	995,271
Pittsburg, Fort Wayne and Chicago	9,076,482
Powers Coal Company and A. and W. Powers	5,000
Price's Inclined Plane	32,830
Pullman Palace Car Company on A. and G. W.	32,004
“ “ “ “ “ C. O. Div. B. and O.	10,000
“ “ “ “ “ M. and C.	40,000
Pittsburg and Lake Erie	51,896
Rocky River	15,428
Salineville Branch	15,000
Sciota Valley	730,501
Springfield, Jackson and Pomeroy	431,526
Toledo, Canada Southern and Detroit	49,850
“ Delphos and Indianapolis	57,700
“ and Ann Arbor	43,650
“ “ Maumee Narrow Gauge	11,500
“ Delphos and Kokomo Narrow Gauge	7,800
Wabash (Toledo, Wabash and Western)	1,065,639
Wheeling and Lake Erie	13,750
Youngstown	8.500
“ and Austintown	4.500
“ “ Connolton Valley	38,872

Total valuation of all railways in the state for taxation in 1879, $75,513,859. Property in the state has usually been assessed at about one-third its cash value. It is presumed that the real value of railroad property in the state is about $225,000,000.

Education.—The total expenditures for school purposes in Ohio are about $10,000,000. Two mills on the dollar constitutes the state tax for the educational fund. The number of school-houses in 1875 was about 12,000; enrolled pupils, 712,129; teachers employed, 22,492; average monthly wages of men teachers, $59.20; women, $45; average cost of instruction per head of enrolled pupils per annum, $17.29. Total value of public school-houses and grounds, $19,876,504. Private schools, 220; teachers, 265; pupils, 13,066. There are 10 normal schools, of which the state sustains only those of Cincinnati and Fostoria, the latter having the largest number of students. The others are sustained by the payment of tuition by students. There are 35 collegiate institutions. The state university and agricultural and mechanical college at Columbus was founded, in 1870, with a state endowment of $700,000; has buildings and grounds that cost $300,000; an income of $30,000 from its endowment; and is in these respects the strongest based institution in the state. Dennison university at Granville, and Oberlin college at Oberlin, both have scientific departments. Besides the colleges already mentioned by number, many of which are supported by denominational sympathy, there are 12 theological seminaries, 3 law schools, and 11 schools of medicine, pharmacy, surgery, and dentistry.

Libraries.—In 1853 a general school law was passed to raise a fund by a tax of one-tenth of a mill on the dollar yearly "for the purpose of furnishing school libraries and apparatus to all the common schools of the state." Within three years thereafter 332,579 volumes were placed in the school libraries. The law was suspended in 1857–58, and the libraries were suffered to go down by negligence. In 1860 the law was re-enacted, and in 1865 350,000 volumes were in the common school libraries. But the system was too attenuated. The small and poor districts had not sufficient funds to maintain continuous care of a library, so that books became scattered and lost almost as fast as fresh purchases were made. The small local school libraries have since been turned over to town library associations under a general law passed in 1867. A law of Feb., 1868, authorized the city councils of any city of the second class to levy a tax, not exceeding one-half of a mill on the dollar, "for a free public library and reading-room, providing suitable accommodations are furnished without expense to the city." Under the action of this benign law noble public libraries are maintained in every large city, and smaller ones of great value in all small towns; and a local pride and public spirit is stimulated to promote their growth by private donations of every kind, to render them more creditable to the town which supports them. The free public library of Cincinnati is probably the largest library ever created from a public fund derived from annual taxation. The library building was begun in 1868, partially occupied with about 31,000 volumes in 1870, and finished and dedicated Feb., 1874. It was at that time the finest library building in America, having a shelf capacity of 250,000 volumes. It opened with 70,000 volumes, and by June 30, 1875, by purchase and donations, the number had swelled to about 100,000 volumes. The number of readers in attendance on Sundays then averaged 1000. The annual income at the same time was $20,000, and increasing with the growth of the city. The creation of this public library at Cincinnati is a sample of the ambitious and successful development of smaller public libraries all over the state. This is exclusive of college and corporate society libraries of every kind.

Publications.—In 1875 the newspapers and periodicals of the state numbered 537, of which 35 were dailies, 10 tri-weeklies, 5 semi-weeklies, 407 weeklies, 1 bi-weekly, 12 semi-monthlies, 63 monthlies, 1 bi-monthly, and 3 quarterlies. The dailies have a circulation in and out of the state of about 200,000 copies daily; the weeklies of 1,500,000 per week. In Cincinnati there are great publishing houses, not of periodicals only, but of standard and light literature and of school-books. Cleveland, Toledo, and Columbus also have considerable publishing houses.

Religious Organizations.—In 1875 there were 8,120 religious societies of all denominations; 6,830 religious edifices; 5,391 ministers and priests; 513,566 members or communicants; and $33,328,000 value of church property. The Methodist denomination is strongest in numbers and value of property; the Roman Catholic next; and the Presbyterians third. Twenty-three names of Christian denominations appear on the census books, ranging in the number of their organizations from 2 to 2,572.

Public Charities.—These consist of the Athens asylum for the insane, maintained at an annual cost of about $120,000; the Cleveland asylum, about $100,000; the Columbus asylum, about $190,000; Dayton asylum, from $90,000 to $100,000; Lucas county asylum, $25,000; Longview, for colored insane, $3,000; the deaf and dumb asylum at Columbus, from $75,000 to $80,000; the blind asylum, from $40,000 to $50,000; the asylum for imbeciles, from $75,000 to $90,000; the soldiers' and sailors' orphans' home, from $75,000 to $100,000; the girls' industrial home, from $40,000 to $50,000; the reform farm school, $60,000 to $70,000; and the Toledo house of refuge, $20,000 to $30,000 The state penitentiary at Columbus is maintained at an expense of about $300,000 a year, against which is credited the receipts from convict labor, which in 1873 were $175,935. The inmates are employed in various trades and their work is let out to contractors. Faithful and good work is credited to the convict at the rate of five days less on the time of his sentence for each month of such labor, and a proportion, not to exceed one-tenth, of his earnings. If he passes his whole term of imprisonment without violating prison rules, he will be restored to citizenship. All the charitable institutions named are maintained out of state funds; but a still wider range of charities are maintained in the cities of the state by societies incorporated under general laws and carried on by contributions of voluntary workers.

Finances.—The auditor's report for 1879 shows:

Total receipts, including balances of preceding years	$6,648,865.07
Disbursements for the year 1879	5,653,752.33
Cash balance in treasury, Nov. 15, 1879	$995,112.74

The above balance is to the credit of the following funds:

General revenue fund	$199,577.83	
Sinking fund	741,804.75	
Common school fund	53,730.16	
		$995,112.74

Receipts on account of the general revenue fund were made up as follows:

Taxes from county treasurers	$2,938,931.46
Public works, tolls, and other sources	217,585.43
Insurance department fees	20,989.20
Ohio penitentiary	175,935.28
Bequest of Matthew Russell	27,215.00
Old C. O. L. asylum grounds	14,619.75
Miscellaneous sources	2,549.47
Balance on hand Nov. 15, 1878	242,584.82
Total receipts on account general fund	$3,640,410.41

Receipts on account of the sinking fund were:

Balance in treasury Nov. 15, 1878		$586,900.28
From county treasurers ½ mill per dollar	$762,839.29	
From sales of school sections	21,541.38	
" " " ministerial lands	1,680.19	
" " " military school lands	6,459.94	
" " " canal lands	4,170.84	
" other assets	380.00	
" Ohio university bonds, interest	2,275.00	
" interest uncalled for, ret'd from N. Y.	5,455.08	
		804,801.72
Total on sinking fund account		$1,391,702.00

Receipts on account of common school fund:

Balance in treasury Nov. 15, 1878	$89,209.87
From taxes	1,527,542.79
Total	$1,616,752.56

The public debt of Ohio Nov. 15, 1879, was $6,476,805.30, due as follows:

Payable in New York July 1, 1868, without interest	$2,500.00
" " " " June 30, 1881, bearing 6 per cent	4,072,640.30
" " " " after Dec. 31, 1886, bearing 6 per cent.	2,400,000.00
Canal loan payable at Columbus	1,665.00
Total state funded debt	$6,476,805.30

The total county debts of the state in 1879 were	$2,872,834.49
" " debts of cities of the first and second class	36,036,069.77
" " " of villages, townships, and school special dist's.	2,581,670.27
Total local debts	$41,490,574.53

By the bulletins of the U. S. census returns of 1880, showing the outstanding bonded indebtedness of cities and towns containing a population of 7,500 or upwards, it appears that Ohio towns and cities stand below the average of all the states in their city debts per capita, and above the average of the cities of the western states.

City debts in an average of all the states	$58.53	per capita.
" " average in north-eastern states	62.15	" "
" " " " middle Atlantic states	76.51	" "
" " " " southern states	55.86	" "
" " " " western states (Ohio included)	32.28	" "
" " of the state of Ohio	50.36	" "

It also appears by the same table that New England pays the lowest interest on its city debts, the middle Atlantic states next, the southern states third, and the western states the highest.

Banks.—There were in Ohio Nov. 1, 1879, 162 national banks in operation, with a paid in capital of $26,221,900, and an outstanding circulation of $21,914,388; and of banks organized in conformity to the state law of 1877 there were 85, with an aggregate capital paid in of $1,989,542, and value of assets of $6,506,088; and of savings banks with no capital stock 4, aggregating $9,959,117, value of securities and assets to secure depositors and stockholders; and of free banks and independent banks of the state of Ohio, being what remains of the old state bank system, 23, with an aggregate outstanding circulation of $60,288, and securities to meet it of $121,925. The average yearly dividend of national banks, for the five years following 1874, on their capital, was 10 per cent. Their loans and discounts range from $20,000,000 to $30,000,000, according to season and circumstances.

Government—The constitution of 1851, with some amendments, and the laws passed under it, are now codified and published. The conditions of suffrage are to be a male, 21 years of age, native or naturalized, to be a resident one year in the state, 30 days in the county, and 20 days in the township, village, or ward, preceding the election where the vote is offered. The second Tuesday in October is the day of general elections. The legislature consists of a senate of 37 members, and a house of representatives of 111 members, elected for two years. The sessions are biennial, beginning the first Monday in January in even years. The governor has a salary of $4,000; lieutenant-governor, $800; secretary of state, $2,000; auditor, $3,000; treasurer, $3,000; comptroller of the treasury, $2,000; attorney-general, $1500 and fees; and commissioner of schools, $2,000. Their term is two years, except the auditor's, which is four years, and the comptroller and school commissioner, who have three-year terms. The board of public works consists of three members, elected one at each general election for two years. The commissioner of railroads and telegraphs, superintendent of insurance, supervisor of public printing, gas commissioner, and state and law librarians, are appointed by the governor. The state board of agriculture consists of 10 members, five of whom are chosen annually for two years at a convention composed of the presidents of the county agricultural societies. Under the apportionment of 1870 the state was entitled to 20 members of congress.

Judiciary.—The judicial power of the state is vested in a supreme court, in district courts, courts of common pleas, courts of probate, justices of the peace, and such other courts inferior to the supreme court as the general assembly may from time to time establish. The supreme court consists of five judges, a majority of whom are necessary to form a quorum or to pronounce a decision. It has jurisdiction in *quo warranto*, *mandamus*, *habeas corpus*, and *procedendo*, and such appellate jurisdiction as may be provided by law. It must hold at least one term a year at the capital, and elsewhere as may be required by law. Supreme judges are elected for five years at general elections, one each year, and the judge having the shortest time to serve is the chief-justice for the year. The state is divided into nine common pleas districts, bounded by county lines. Hamilton county constitutes one district. Each district consisting of three or more counties is sub-divided into three sub-districts, in each of which one judge is elected for two years by the voters of that sub-division. Courts must be held at least once a year in every county in the district, and two or more judges may hold court in a county at the same time, taking cases alternately on the docket in their order. District courts are composed of the judges of the court of common pleas of a district, and one judge of the supreme court, who, with two of the former, constitute a quorum, and have the same original jurisdiction as the supreme court and such appellate jurisdiction as may be fixed by statute. A probate judge is elected for three years by each county. The probate court has jurisdiction in probate and testamentary matters, the appointment of administrators and guardians, the settlement of their accounts and those of executors, and the power to limit and authorize their action. It is empowered also to try municipal cases involving the awards of damages for the condemnation of private property for public use; is a court of record, and has the issuing and record of marriage licenses. Vacancies of judges are filled by the governor for an unexpired term. The legislature has power to increase or diminish the number of judges, alter districts, and establish other courts. Judges may be removed by a concurrent resolution of both houses of the legislature, if two-thirds of all the members concur. Justices of the peace are elected in every township for three years.

The following is the list of governors:

	GOVERNORS.	
1.	Arthur St. Clair, territorial	1788-1802
2.	Charles W. Byrd, territorial	1802-1803
3.	Edward Tiffin, state	1803-1807
4.	Thomas Kirker (acting)	1807-1808
5.	Samuel Huntington	1808-1810
6.	Return J. Meigs	1810-1814
7.	Othniel Looker (acting)	1814-1814
8.	Thomas Worthington	1814-1818
9.	Ethan Allen Brown	1818-1822
10.	Allen Trimble (acting)	1822-1822
11.	Jeremiah Morrow	1822-1826
12.	Allen Trimble	1826-1830
13.	Duncan McArthur	1830-1832
14.	Robert Lucas	1832-1836
15.	Joseph Vance	1836-1838
16.	Wilson Shannon	1838-1840
17.	Thomas Corwin	1840-1842
18.	Wilson Shannon	1842-1844
19.	Thomas W. Bartley (acting)	1844-1844
20.	Mordecai Bartley	1844-1846
21.	William Bebb	1846-1849
22.	Seabury Ford	1849-1850
23.	Reuben Wood	1850-1853
24.	William Medill (acting)	1853-1854
25.	Salmon P. Chase	1856-1860
26.	William Dennison	1860-1862
27.	David Tod	1862-1864
28.	John Brough	1864-1865
29.	Charles Anderson (acting)	1865-1866
30.	Jacob Dolson Cox	1866-1868
31.	Rutherford B. Hayes	1868-1872
32.	Edward F. Noyes	1872-1874
33.	William Allen	1874-1876
34.	Rutherford B. Hayes	1876-1878
35.	William H Bishop	1878-1880
36.	Charles Foster	1880-1882

ELECTORAL AND POPULAR VOTES FOR PRESIDENT AND VICE-PRESIDENT.

Election Year.	Candidates for whom the electoral votes of the state were cast.	Electors.	Popular vote.	Candidates of the opposition.	Popular vote.	Third party candidates.	Popular vote.
1804..	Thomas Jefferson, P. George Clinton, V.P.	3	No record.	Charles C. Pinckney, P. Rufus King, V.P.	No record	....	.....
1808..	James Madison, P... George Clinton, V.P.	3	"	Charles C. Pinckney, P. Rufus King, V.P.	"	....	.....
1812..	James Madison, P... Elbridge Gerry, V.P.	7	"	De Witt Clinton, P. Jared Ingersoll, V.P.	"	....	.....
1816..	James Monroe, P.... D. D. Tompkins, V.P.	8	"	Rufus King, P. John E. Howard, V.P.	"	....	.....
1820..	James Monroe, P.... D. D. Tompkins, V.P.	8	"	John Quincy Adams, P. Richard Rush, V.P.	"	....	.....
1824..	Henry Clay, P ..... Nathan Sanford, V.P.	16	19,255	Andrew Jackson, P. John C. Calhoun, V.P.	18,457	John Q. Adams, P. John C. Calhoun, V.P.	12,280
1828..	Andrew Jackson, P.. John C. Calhoun, V.P	16	67,597	John Q. Adams, P... Richard Rush, V.P.	63,396	None. None.	
1832..	Andrew Jackson, P. M. Van Buren, V.P..	21	81,246	Henry Clay, P....... John Sargent, V.P...	76,589	William Wirt, P..... Amos Ellmaker, V.P.	no report.
1836..	Wm. H. Harrison, P. Francis Granger, V.P	21	105,405	Martin Van Buren, P. R. M. Johnson, V.P..	96,948	Hugh L. White, P... John Tyler, V.P.....	no report.
1840..	Wm. H. Harrison, P. John Tyler, V. P....	21	148,157	Martin Van Buren, P. R. M. Johnson, V.P..	124,782	James G. Birney, P. Thomas Earle, V. P..	903
1844..	Henry Clay, P....... T. Frelinghuysen, V.P	23	155,057	James K. Polk, P ... George M. Dallas, VP.	149,117	James G. Birney, P.. Thomas Morris, V.P.	8,050
1848..	Lewis Cass, P........ Wm. O. Butler, V.P..	23	154,775	Zachary Taylor, P... Millard Fillmore, V.P	138,360	Martin Van Buren, P Chas. F. Adams, V.P.	35,354
1852..	Franklin Pierce, P.. William R. King, V.P.	23	169,220	Winfield Scott, P.... Wm. A. Graham, V.P.	152,526	John P. Hale, P..... Geo. W. Julian, V.P.	31,732
1856..	John C. Fremont, P.. Wm. L. Dayton, V.P.	23	187,497	James Buchanan, P. J. C. Breckenridge VP	170,874	Millard Fillmore, P.. A. J. Donelson, V.P.	28,126
1860..	Abraham Lincoln, P. Han. Hamlin, V.P...	23	231,610	Stephen A. Douglas, P H. V. Johnson, V.P..	187,232	John Bell, P........ Edward Everett, V.P.	12,193
1864..	Abraham Lincoln, P. And. Johnson, V.P...	21	265,154	Geo. B. McClellan, P, G. H. Pendleton, V.P.	205,568	None. None.	
1868..	Ulysses S. Grant, P.. Schuyler Colfax, V.P.	21	280,223	Horatio Seymour, P. F. P. Blair, Jr., V.P..	238,606	None. None.	
1872..	Ulysses S. Grant, P.. Henry Wilson, V.P..	22	281,852	Horace Greeley, P... B. Gratz Brown, V.P.	244,321	Charles O'Conor, P.... James Black, P.	1,163 2,162
1876..	R. B. Hayes, P...... Wm. A. Wheeler, V.P.	22	330,698	Samuel J. Tilden, P.	323,182	Peter Cooper, P.......	3,057
1880..	Jas. A. Garfield, P... C. A. Arthur, V.P....	22	375,048	W. S. Hancock, P... Wm. H. English, V.P.	340,821	James B. Weaver, P. B. J. Chambers, V.P.	6,456

Ohio in 1880 has 20 congressional districts and representatives in congress.

OHIO, a co. in s.e. Indiana, adjoining Kentucky; bounded on the e. by the Ohio, on the n.w. by Laughery creek; 100 sq.m.; pop. '80, 5,563—5,289 of American birth. The surface is uneven and hilly, and the soil fertile. The principal productions are corn, wheat, barley, oats, and potatoes. Co. seat, Rising Sun.

OHIO, a co. in w. Kentucky, bounded on the s.w. by Green river, watered by Rough creek; on the Paducah and Elizabethtown railroad; 730 sq.m.; pop. '80, 19,669—1464 colored. The surface is rolling and well-wooded, and contains coal and iron. The soil is fertile, and the principal productions are corn, tobacco, wheat, potatoes, wool, and hay. Co. seat, Hartford.

OHIO, a co. in n.w. West Virginia, adjoining Pennsylvania, bounded on the w. by the Ohio, intersected by Wheeling creek; on the Baltimore and Ohio railroad; 100 sq.m.; pop. '80, 37,457—856 colored. The surface is uneven and hilly, and contains deposits of bituminous coal. The soil is fertile, and produces good crops of corn, wheat, hay, and oats. There are many iron manufactories. Co. seat, Wheeling.

OHIO RIVER, a river of the United States of America, called by the French explorers after its Indian name, *La Belle Rivière*, next to the Missouri the largest affluent of the Mississippi, is formed by the union of the Alleghany and Monongahela, at the western foot of the Alleghanies, at Pittsburg, in Pennsylvania, and flows w.s.w. 975 m., with a breadth of 1200 to 3,000 ft., draining, with its tributaries, an area of 214,000 sq. miles. In its course it separates the northern states of Ohio, Indiana, and Illinois, from the southern states of Virginia and Kentucky. The principal towns upon its banks are Cincinnati Louisville (where there are rapids of 22 ft. in a m., with a steam-boat canal), Wheeling, Maysville, Pittsburg, and Cairo. It is usually navigable from Pittsburg, but for larger steamers in summer only from Wheeling. The banks of the Ohio are generally high and terraced. It is often shallow, is sometimes frozen, and is subject to floods of 50 or 60 ft. above low-water. Bordered by a rich country, and great deposits of coal and iron, it is the channel of a vast commerce, which it shares with its chief branches, the Tennessee, Cumberland, Wabash, Green, etc.

OHIO RIVER (*ante*). It is probably incorrect to name the Ohio river as the largest affluent of the Mississippi next to the Missouri, as the Arkansas river lays claim to that position both by its length and the volume of its waters. The distance from where the

Ohio begins by the confluence of the Alleghany and Monongahela at Pittsburg to its mouth is 975 m.; but the entire length of the river should include the whole length of the Alleghany, the longest of its river sources, which is not less than 300 m. more. The river was discovered by the cavalier de la Salle in the fall and winter of 1669–70. He had for several years before been gathering information concerning it from the Iroquois who visited his seignory at La Chine above Montreal, and finally reached its source by the way of Niagara and up Cattaraugus creek; from which his Indian guide is supposed to have led him to French creek, one of the w. sources of the Alleghany, and only 14 m. from lake Erie. It is supposed that his canoes were carried from Cattaraugus creek over to French creek, though it is possible that the portage may have been made from the upper waters of the Genesee river. With canoes launched in autumn on the stream of the Alleghany the discovery of the Ohio followed naturally, and was arrested only by the falls where Louisville now stands. There La Salle turned back, still undecided whether the stream emptied into the gulf of Mexico or into the Pacific ocean, but inclining to the latter opinion. It must have been from the time of this voyage that the river acquired the title of *La belle rivière*—the beautiful river, which it was subsequently called by the French. The source of the Alleghany is in the center of Potter co., Penn., the middle of the n. tier of counties, where the table-lands receive the rainfalls which hesitate which way to flow—whether to join the waters of the St. Lawrence, or to seek the valley that leads them to the gulf of Mexico. See ALLEGHANY RIVER. The junction of the Monongahela at Pittsburg forms the Ohio. These rivers, rising one n. and the other s. in the Alleghany range, meet in the heart of wooded hills like those through which they have flowed, and the Ohio for 500 m. of its course below, plows its way through a valley deepening and widening as it goes till the rounded hills along this part merge into the rolling prairies of southern Indiana and Illinois, and disappear in the lowlands below the junction of the Wabash. Its entire valley has been eroded by the action of the water, and though everywhere beautiful in a state of nature, is nowhere picturesque or wild. The geologic formations along its entire line are nearly level and little disturbed by any violent convulsion. The area of its drainage is 214,000 sq.m.; embracing a small part of the state of N. Y., one-third of Pennsylvania, two-thirds of Ohio, all of West Virginia, Kentucky, and Tennessee, small portions of North Carolina, Georgia, Alabama, and Mississippi, two-thirds of Indiana, and the s.e. part of Illinois. In this area are included the great valleys of the Tennessee and Cumberland rivers, which join the Ohio only near its mouth. The shores through much of the upper half of the river present a series of plateaus and broken bluffs that indicate successive wearings below the plane of its former flow, and exhibit a broad valley from 5 to 10 m. in width between its bounding hills. The immediate shores at ordinary stages of the water are cut through alluvium generally, with the marks of recent wearing of water and caving of banks. From Pittsburg to Portsmouth the adjacent hills are mined for coal or iron in many places, and the loading of both into barges in the river is done to an unusual extent by those who own both mines and boats and market their own productions. The s.e. part of Ohio as well as w. of Pennsylvania is a landscape spotted with the smoke of furnaces for the manufacture of iron. Among the abrupt hills below Pittsburg the river is only 1000 ft. wide at low water, and 1200 at high water. It widens gradually below and its high stages frequently cover a vast extent of bottom lands. The range between its high and low stages of water is very great, 60 ft. being the greatest difference, and 45 ft. the mean difference. The navigation below Louisville is good for large steamers at all seasons, and is usually maintained for most of the summer up to Wheeling, and in good stages of water up to Pittsburg; but is often too low in summer to permit the "down river boats" to make their trips up to Cincinnati. For rafting and for coal and iron barges it is good at all seasons. At Louisville are the only rapids. These fall 27 ft. in 2¼ m., and are passed by means of a ship canal with locks for the largest river steamers, and affording an abundant water-power. The immense passenger travel formerly by river steamers has largely been transferred to the railways. The rate of the current varies from one to three m. an hour, depending on the volume. The rivers which flow to the Ohio from the n. are the Alleghany, Muskingum, Hocking, Sciota, Big and Little Miamis, and the Wabash; from the s. the Monongahela, Little Kanawha, Great Kanawha, Sandy, Licking, Kentucky, Green, Cumberland, and Tennessee. The principal cities and towns upon its banks are Pittsburg, Wheeling, Elizabethtown, Marrietta, Parkersburg, Pomeroy, Gallipolis, Ironton, Portsmouth, Cincinnati, Covington, Newport, Laurenceburg, Madison, Louisville, New Albany, Leavenworth, Evansville, Paducah, and Cairo at its mouth where it joins the Mississippi.

OHIO WESLEYAN UNIVERSITY, at Delaware, Delaware co., Ohio, was founded in 1844, under the auspices of the Methodist church in Ohio. In 1877 the Ohio Wesleyan female college, founded in 1853, was united with the university. Its building is now known as the Monnett hall of the university, and is the home of the lady pupils. The productive endowment is over $250,000, the annual income $82,000. The grounds used for academic purposes lie in the lots, about half a mile apart. One is the original campus of the university, containing twenty-five acres, and having on it four large buildings. The other is the campus of the Monnett hall, containing ten acres, and having on it one very large building. The cabinet rooms are ample and admirably arranged. The collection contains about 100,000 specimens. In the departments of conchology and Ohio geology the series are quite complete. The philosophic and chemical apparatus is not so extensive, but sufficient for all academic work, and the laboratories are well equipped. There are two college libraries, aggregating 15,000 volumes, and a reading-room open and free to all the pupils. The number of professors in 1880 was 8, besides two vacancies, and there were 12 other regular instructors. The faculty of arts is the only one yet organized, but a beginning is made for a biblical course, and for scientific schools. There is also a department of fine arts for ladies. The number of students in the catalogue for 1879 was 615, of whom 182 were ladies. Ladies are admitted to all the courses of study, classical or scientific; but a special ladies' course is prescribed for those who do not elect one or the others. There is likewise a normal course for those who would fit themselves for teaching. A preparatory department is maintained, with a three years' course of study, and most of the college students are here prepared. The college classes number 243, the normal class 48, the preparatory 325. The alumni number 750 gentlemen and over 400 ladies. President, Rev. Charles H. Payne, D.D., L.L.D.

OHLAU, **Olau**, or **Olawa**, a t. of Prussian Silesia, 17 m. s.e. from Breslau, on the Oder. Ohlau, which is on the railway between Breslau and Vienna, is an ancient town, with a royal palace and an old castle. At the present day, it is a place of considerable industrial activity. Being the capital of a circle, it has numerous district courts and offices. Pop. '75, 7,963.

OHM, unit of resistance. See GALVANISM (OHM'S LAW), *ante*.

OHM, GEORGE SIMON, 1787–1854; b. Germany; educated at Erlangen. After giving mathematical instruction in a number of places, he was called, in 1817, to a chair in the Jesuit college at Cologne, and the next year published an elementary treatise on geometry. He made a study of the laws of galvanic currents and finally discovered the theorem called "Ohm's Law," upon which the mathemetical theory of electricity is founded. An exposition of this theory is contained in *The Galvanic Chain, Mathematically worked out*, 1827. Among his other works are: *Elements of Analytical Geometry*, 1849, and *Principles of Physics*, 1854,. He left his professorship at Cologne in 1826, was director of the Nuremberg polytechnic school 1833–49, and was then called to the chair of physics at Munich

OÏDIUM, an important genus of minute fungi of the section *Hyphomycetes*, growing on diseased animal and vegetable substances. They consist of minute tubular threads, forming flocks, white in some species, brightly colored in others, simple or irregularly branched, assuming in their upper part the form of strings of beads, which finally break up into elliptic spores. The species actually existing are probably much more numerous than those which have been fully ascertained. Among the most important of the vegetable parasites of man is *O. albicans*, which is found on the epithelium in the mouth and throat in the disease called *aphthæ*, or thrush, and on that of the throat in diphtheria; also sometimes in the nostrils, stomach, and intestines, on the nails, the nipples, and other places. It is more common in children and in aged persons, than in those who are in the prime of life. It occurs frequently in the last stages of many diseases, when the mucous membrane is covered with nitrogenous decomposable matter. Indeed, it would seem that whatever may be the case as to other vegetable parasites, no species of Oïdium begins its attack upon a perfectly healthy surface, either animal or vegetable, a diseased state of the tissue being to these fungi a necessary condition of vegetation "just as the yeast-plant will not vegetate save in a fermentable fluid, that is, in a solution which, in addition to sugar, contains some decomposable albuminous matter." *O. albicans* appears to the naked eye as a white pasty substance, slightly elevated above the mucous membrane to which it adheres; but under the microscope, its filamentous structure is easily perceived. Its seat is at first on the upper surface of the epithelial cells, but its filaments soon penetrate deeply between them, and the upper epithelial layers are soon worn out, and thrown off by the rapid growth from below. However incapable the *O. albicans* may be of attacking a healthy surface, there can be no doubt that it greatly contributes to the extension of disease, and that it is very readily communicable from one patient to another when there is catarrh or other inflammatory affection of the mucous membrane.

Another species of oïdium which has attracted great attention is *O. Tuckeri*, regarded by many as producing the grape disease, which, several years ago, injured the vineyards of many parts of the world, but in accordance with the views already expressed, perhaps rather to be regarded as merely accompanying and extending the disease. It may probably be the case that over-cultivation of particular varieties of grape, and too long continued cultivation on the same ground, have so impaired the vigor and healthfulness of the plants as to make them liable to the attacks of this parasite. *O. Tuckeri* makes its appearance at first in the form of a *mycelium* of webby, creeping, branching filaments, which send out upright or decumbent jointed stems. The bead-like joints of the stems become successively filled with spores, which are finally discharged in little clouds for the multiplication of the species. The grape disease was first observed in Kent, England, in the spring of 1845, on vines in the vinery of Mr. Tucker. The ends of the young shoots assumed a crispy appearance, began to wither, and then dried up. The unripe grapes were next attacked, becoming covered with a grayish-white bloom, the skin of the grapes being destroyed, and they rotted and dried up. The disease rapidly spread over other English vineries; was observed about the same time in the vineries of Paris, and soon in the vineyards of almost all parts of France, Italy, Greece, Tyrol, and Hungary; finally, and in a slighter degree, affecting the vineyards of the Rhine. Its ravages extended to Algeria, Syria, Asia Minor, and many other countries, among which is particularly to be noticed the island of Madeira, where it proved almost completely destructive to the grapes, and nearly put an end to the production of the celebrated Madeira wine. The importation of Madeira wine to Britain in 1831 amounted to 209,127 gallons; and in 1861 only to 28,749 gallons. It is probable that the complete isolation of the Madeira vineyards made the progress of the disease more rapid, and its results more complete than elsewhere, by causing a prevalence of the conditions favorable for it. No kind of vine escaped. The grape disease is first perceived in the leaves, which become whitish, in consequence of a mycelium spreading over the upper surface of the leaf. The leaves sometimes curl up, or they become black at the center, the blackness extending towards the circumference, and finally they drop off. The plant, through loss of its leaves, now becomes more unhealthy; the shoots are attacked by the disease, the stalks of the bunches of grapes, and the grapes themselves. The parasite penetrates into the young wood, the shoots are covered with spots and blotches of a reddish-brown, or even black color, and look as if a red-hot iron had been applied to them. Sometimes they secrete a clammy inodorous fluid all over their surface; and in many cases they wither from the top down half their length. The affected grapes very often first exhibit the disease in a single whitish spot on a single grape of a bunch, which enlarges by radiating irregularly. If in a bunch there is one abortive grape, it often shows signs of the disease, whilst the rest remain free. The creeping branches of the mycelium are fixed upon the skin of the grape by rootlets, which do not penetrate into the juicy pulp. The mycelium sends up vertical fertile branches of nearly equal height, densely aggregated, and forming a velvet-like mass. The extremities of these become beaded; and at last the uppermost cell or bead increases in volume, becomes detached, and is carried off by some slight breath of air, to multiply the species by the dispersion of its spores. The other bead-like cells follow in succession.

Various means were resorted to for the prevention and cure of the grape disease. The application of pulverized sulphur was found useful, the fungus withering and drying up when brought into contact with a minute particle of sulphur. The application of sulphur must be frequent, as portions of the mycelium and some of the spores always escape. The use of sulphur was the chief means of checking the spread of oïdium in French and European vineyards; it became general in the south of France and in Italy; and in consequence of its national importance, the duty on sulphur was reduced by the French government. Hydrosulphide of lime was also applied to vines with very beneficial effect. It is prepared by thoroughly mixing 68 ounces of flowers of sulphur with the same quantity of slaked lime, adding three or four quarts of water, boiling for about ten minutes, allowing it to settle, and decanting the clear liquor. When it is to be used, one quart is mixed with 100 quarts of water, and it is poured over the vines.

OIL-CAKE, the cake which remains in the press when seeds are crushed to express the oil which they contain. Oil-cake still retains a portion of the oil of the seed, along with almost all its other constituents, and is valuable either for feeding cattle or for manure. *Linseed-cake* is so much more largely used in Britain than any other kind that the name oil-cake is in general exclusively appropriated to it, the other kinds being known as *rape-cake*, *poppy-cake*, *hemp-cake*, *colza-cake*, etc., according to the plant from the seed of which they are produced. The use of oil-cake for feeding cattle has very much increased of late years, and it is an article of commercial importance. Large quantities are imported into Britain from different parts of the continent of Europe, and from North America. But *English linseed-cake*—cake made at oil-mills in England, mostly from imported seed—is preferred to any other, because heat not being so freely applied during the expression of the oil, more oil is left in the cake, and also because foreign cake often suffers from dampness both before and during the sea passage. Besides the oil which remains in it, linseed-cake contains from 24 to 33 per cent of nitrogenous substances or protein compounds, which make it very valuable both for feeding cattle and for manure. The value of linseed-cake for feeding is greater than that of any kind of grain or pulse.—*Rape-cake* is, next to linseed-cake, the kind of oil-cake best known in Britain. It is much cheaper than linseed-cake, but is not relished by cattle, having a hot taste, and a tendency to become rancid. Sheep, however, eat it readily, and it is often employed for fattening them. It is often also ground to a coarse powder (*rape-dust*), and used as a manure, Its fertilizing power is great, and it is used by the Flemish farmers as guano now is by those of Britain.—*Cotton seed-cake* is much used as a manure in some parts of North America.—*Cocoa-nut-cake* is used in the south of India, both for feeding cattle and for manure.—Other kinds of cake are noticed, if sufficiently important, under the plants from which they are derived. Their properties are generally similar to those of linseed-cake, although the pungency of some, as *mustard-cake*, renders them unsuitable for feeding cattle. See Oils.

OIL CITY, a borough of Oil Creek township, Crawford co., Penn., situated on the Alleghany river, at the mouth of Oil creek, 9 m. from Franklin; pop. '70, about 2,500; of township, 5,098. The city lies on a narrow stretch between the river and a steep bluff, on which are many of the private residences. It was founded in 1860 and incorporated in 1871. The people are chiefly engaged in refining, barreling, and shipping petroleum. Nearly 2,000,000 barrels are shipped from the oil wells of the vicinity yearly. There are 5 banks, 2 refineries, a daily and weekly paper, an oil exchange, and many churches and schools.

OIL-FUEL. A great incentive has been given by the discovery of copious wells of petroleum (see OIL-WELLS AND OIL-TRADE) to the invention of some mode of using oil as a fuel for furnaces and stoves. Such attempts had often been made before; but they assume a new aspect now that oil has become so much cheapened. Nearly half the carrying capacity of European steamships, and more than half in those which make long voyages, is taken up with the stowage of coal. Petroleum (q.v.) gives out nearly twice as much heat as an equal weight of anthracite or steam coal.

As respects the use of petroleum for raising steam, several reports have been made public, stating that it has been so employed with success; but a careful examination of the most reliable experiments plainly shows that as yet, at any rate, this cannot be done economically, except in rare instances, such as in the oil regions of the United States. In a full and apparently very reliable report on petroleum in all its bearings by Mr. J. Lawrence Smith, published in the general report of the judges of group. III., Philadelphia exhibition of 1876, it is stated that the average price of anthracite coal in America is eight dollars per ton, and at this rate petroleum for equal heating-power would cost three times as much. In Great Britain, where paraffine oil is as cheap as petroleum, the advantage in the use of coal is much greater. The reports of Mr. T. Lloyd to the English admiralty, and by Mr. Isherwood, chief of the bureau of engineering in the U. S. navy, agree in stating that, although mineral oils can be burned without difficulty for raising steam, it has yet to be proved whether they can be used successfully and safely at sea. The eminent French chemist, St. Claire Deville, has perhaps made what are as yet the most trustworthy experiments respecting the burning of mineral oils for raising steam in locomotives. He considers that only the heavy and thick-flowing kinds can be used to advantage in heating these engines; that with heavy oil steam can be got up in the same time as with coal; and that, as compared with the latter, the oil required is only about one-half the weight. On one of the railways in the s. of Russia, the petroleum found at Baku, on the Caspian sea, was burned for a time in the locomotives; but although a success from an engineering point of view, it was found to be too costly a fuel. For a drawing of the furnace used, see *Engineering* for Jan. 5, 1877.

The chief advantages of petroleum compared with coal as a fuel in raising steam are its greater heating-power, the smaller storage space it requires, and its freedom from ash. Its disadvantages are greater cost, difficulty in burning without much smoke or tarry deposits, and the danger attending its use.

More success has attended the use of petroleum in metallurgical processes. Its freedom as a fuel from deleterious ingredients gives it at once a great advantage here. One of the best petroleum furnaces for working iron is that designed by Dr. C. J. Eames, now at work in Jersey City, U. S. The petroleum is made to drip over a series of shelves in an iron vessel, and is there converted into vapor and carried forward by superheated steam to be mixed with air, and is then immediately burned in the "combustion-chamber" at the end of the furnace, close to where the iron is piled. Steam in one condition or another is used to convert the petroleum into vapor in most furnaces where it is used. In furnaces for bending armor-plates, and also for working thinner iron plates, mineral oil has been found to have the advantage over coal of raising the heat required in a much shorter time. It also produces less scale on the iron, and with it the heat is more easily concentrated on a portion of the plate.

OILLE'TS, or ŒILLETS, small openings, often circular, used in mediæval buildings for discharging arrows, etc., through.

OIL MILL. See OILS.

OIL PALM, *Elæis*, a genus of palms, of the same tribe with the cocoa-nut palm. The best known species, the oil palm of tropical Africa, sometimes attains a height of 60 to 80 feet. The stems are thickest in the middle, tapering chiefly upwards. The leaves are pinnate, their footstalks spiny. The flowers have a strong peculiar smell, like that of anise or chervil. The fruit forms an immense head, like a great pine-apple, consisting of a great number of bright orange-colored drupes, having a thin skin, an oily pulp, and a hard stone. The pulp of the drupes, forming about three-fourths of their whole bulk, yields, by bruising and boiling, an oil, which when fresh has a pleasant odor of violets, and when removed into colder regions acquires the consistency of butter. This oil is now very largely imported from tropical Africa into Britain, and is much used for many purposes, as for making candles, toilet soaps, etc., and for lubricating machinery and the wheels of railway carriages. When fresh, it is eaten like butter. See OILS. The nut was formerly rejected as useless after the oil had been obtained from the fruit; but from its kernel a fixed oil is now extracted, called PALM-NUT OIL; which is clear and limpid, and has become to some extent an article of commerce. The oil palm abounds in mangrove swamps, but is also a conspicuous feature of the landscape on sandy coasts in the tropical parts of western Africa. It yields from its trunk abundance of a pleasant and harmless beverage, which, however, becomes intoxicating in a few hours, called *malova* in Angola, and much used there as an alcoholic stimulant. The unripe nuts of the oil palm are used in some parts of Africa for making an excellent kind of soup. The oil palm has been introduced into some parts of America, and is now abundant in them.

OIL-REFINING. Several oils, from the mode of their extraction, are necessarily impure, and various means are taken for refining or purifying them: thus, the so-called *fish-oils*—that is, whale, seal, cod, etc.—are clarified either by mixing them with a chemical solution, or by passing steam through them and filtering through coarse charcoal. The chemical solutions employed are various. One method is, to use a strong solution of oak bark, the tannic acid in which combines with the albuminous matters present in the oil, and precipitates them; another plan is, to agitate bleaching-powder, formed into a milk with water, with the oil; and then, after subsidence of the chloride of lime and water, to wash the oil with water, or jets of steam passed through it. A more simple and very effective plan, invented by Mr. Dunn, is to apply a steam heat not exceeding 200° F., and then pass a current of air of the same temperature through it continuously for some time: this effectually bleaches the oil.

Olive, and some other vegetable oils, are refined by agitating them with a saturated solution of caustic soda. This renders the whole soapy; but after a time the oil precipitates a saponaceous deposit, and the remainder becomes quite clear and pure, and is then poured off. The value of several of the most important oils of commerce is so greatly increased by refining, that this art has now become a very important branch of business, and is carried out on a large scale.

OILS (including fats). The fats and fixed oils constitute an important and well-marked group of organic compounds, which exist abundantly both in the animal and vegetable kingdoms. They are not simple organic compounds, but each of them is a mixture of several such compounds to which the term *glycerides* is applied; and the glycerides which by their mixture in various proportions form the numerous fats and oils are mainly those of palmitic, stearic, and oleic acids—if we adopt the recent view that margaric acid (q.v.) has no independent existence—and to a less extent those of other fatty acids, which will be presently noticed, such as butyric, caproic, caprylic, and capric acids, which are obtained from butter; myristic acid, which is obtained from cocoa-nut oil, etc. The members of this group may be solid and hard, like suet; semi-solid and soft, like butter and lard; or fluid, like the oils. The solid and semi-solid are, however, generally placed together and termed fats, in contradistinction to the fluid oils. The most solid fats are readily fusible, and become reduced to a fluid or oily state at a temperature lower than that of the boiling-point of water. They are not volatile, or, in other words, they cannot be distilled without decomposition, and it is not until a temperature of between 500° and 600° is reached that they begin nearly simultaneously to boil and to undergo decomposition, giving off acroleine (an acrid product of the distillation of glycerine) and other compounds. In consequence of this property, these oils are termed *fixed oils*, in contradistinction to a perfectly separate group of oily matters, on which the odoriferous properties of plants depend, and which, from their being able to bear distillation without change, are known as *volatile oils*. These, which are also known as *essential* or *ethereal oils*, differ *in toto* in their chemical composition from the compounds we are now considering, and will be separately noticed in the latter part of this article. All the fats and oils are lighter than water, and are perfectly insoluble in that fluid. Their specific gravity ranges from about 0.91 to 0.94. They dissolve in ether, oil of turpentine (one of the volatile oils), benzole, and to a certain extent in alcohol; while, on the other hand, they act as solvents for sulphur, phosphorus, etc. If a fatty matter be shaken with a watery solution of albumen, gum, or some other substance that increases the density of the water, and renders it viscid, the mixture assumes a milky appearance, in consequence of the suspension of the fat or oil in the form of microscopic globules, and is termed an *emulsion*. These bodies possess the property of penetrating paper and other fabrics, rendering them transparent, and producing what is well known as a greasy stain. They are not readily inflammable unless with the agency of a wick, when they burn with a bright flame. In a pure and fresh state they are devoid of taste and smell, but on exposure to the air they become oxidized and acid, assume a deeper color, evolve a disagreeable odor, and are acrid to the taste; or, in popular language, they become *rancid*. The rapidity with which this change occurs is considerably increased by the presence of mucilaginous or albuminous bodies. The rancidity may be removed by shaking the oil in hot water in which a little hydrated magnesia is suspended.

The general diffusion of fats and oils in the animal kingdom has been already described. (See FATS, ANIMAL.) In the vegetable kingdom they are equally widely distributed, there being scarcely any tissue of any plant in which traces of them may not be detected; but they are especially abundant in the seeds. The seeds of the *cruciferæ* are remarkably rich in oil; linseed yielding fully 20 per cent and rape-seed about 40 per cent of oil; and some fruits, as those of the olive and oil-palm, yield an abundance of oil.

The uses of the oils and fats are numerous, and highly important, various members of this group being extensively employed as articles of food, as medicines, as lubricating agents, in the preparation of soaps, plasters, ointments, varnishes, pigments, candles and other means of illumination, for the purpose of dressing leather, etc. The following are the most important members of the group:

1. *Vegetable Fats.*—The chief solid fats of vegetable origin are cocoa-nut oil, nutmeg butter, and palm oil. The fluid vegetable fats or oils are divisible into the *non-drying* and the *drying oils;* the latter being distinguished from the former by their becoming dry and solid when exposed in thin layers to the air, in consequence of oxygenation; while the former do not absorb oxygen, but are converted by hyponitric acid or sub-oxide of mercury into elaidine (as described in the article Oleine), a reaction which is not exhibited by the drying oils. Some of the drying oils, especially linseed oil, when mixed with cotton, wool, or tow, absorb oxygen so rapidly, and consequently become so heated as to take fire, and many cases of the spontaneous combustion of heaps of oily materials that have been employed in cleaning machinery have been recorded. The drying property may be much increased by treating the oils with a little litharge or oxide of manganese, and linseed oil thus treated is then known as *boiled oil.* The chief non-drying oils are olive oil, almond oil, and colza oil; while the most important drying oils are those of linseed, hemp, poppy, and walnut; castor oil seems to form a link between these two classes of oils, since it gradually becomes hard by long exposure to the air.

2. *Animal Fats.*—The chief solid fats are suet, lard, butter, goose grease, etc.; while among the fluid fats or oils, sperm oil, ordinary whale oil, cod-liver oil, and neat's-foot oil may be especially mentioned. In many of their characters, spermaceti and bees-wax resemble the solid fats, but, as will be shown in the articles on these subjects, they are not glycerides. As a general rule, stearine and palmitine, both of which have comparatively high fusing points (between 157° and 114°), preponderate in the solid fats; while oleine, which is fluid at 32°, is the chief constituent of the oils.

One or two of the most important of the decompositions of the fats must be noticed. When any of these bodies are heated with the hydrated alkalies, they undergo a change which has long been known as saponification, or conversion into soap (q. v.), in which the fatty acid combines with the alkali to form a *soap,* while the sweet viscid liquid glycerine is simultaneously formed. The combination of a fatty acid with oxide of lead forms a *plaster.* For further details on these points, the reader is referred to the articles Soap and Plasters.

The process of saponification affords a ready means of isolating the fatty acids, as the stearic or oleic acid may be at once separated from an alkaline stearate or oleate by the addition of hydrochloric or tartaric acid. When the fatty acids are, however, required on a large scale, as for the manufacture of the so-called stearine-candles, which in reality consist mainly of stearic and palmitic acids, sulphuric acid and the oil or fat are made to act upon each other at a high temperature. See Candle. The fatty acids may also be procured in a very pure form by the injection of superheated steam at a temperature of between 500° and 600° into heated fat—a process which, according to prof. Miller, "from its simplicity and from the purity of the products which it yields, bids fair to supersede those previously employed in the preparation of the fatty acids for illuminating purposes."

The only fatty acids which have been specially mentioned in this article are those which occur in natural glycerides, such as stearic, palmitic, and oleic acids. The term *fatty acid* has, however, in chemistry a wide signification, and is applied to many acids homologous to stearic acid, but not occurring in any natural fats or oils. Thus stearic acid may be taken as the type of a group of acids (of which seventeen are already known) represented by the general formula, $C_{2n}H_{2n}O_4$, commencing with formic acid ($C_2H_2O_4$), including acetic, propionic, butyric, valeric (or valerianic), caproic, œnanthylic, caprylic, pelargonic, capric, lauric, myristic, palmitic, stearic, arachidic, and cerotic acids, and terminating with melissic acid ($C_{60}H_{60}O_4$). These are divided into the volatile and the true (or solid) fatty acids; the volatile acids being those from formic to capric acid, while the remainder, beginning with lauric acid, are the true fatty acids. The *volatile fatty acids* are fluid, and for the most part oily at ordinary temperatures, may be distilled without change, possess a pungent odor, and are acid to the taste, and their solutions redden litmus paper strongly. The *true fatty acids,* on the other hand, are solid at ordinary temperatures, are devoid of taste and smell, cannot be distilled, except *in vacuo,* without decomposition, and only exert a slight action on litmus. The volatile acids occur in the animal and vegetable kingdoms (formic acid, for example, in red ants, and valeric acid in the root of valerian), and they are likewise produced by the oxidation and spontaneous decomposition of numerous animal and vegetable products. The entire series, up to capric acid, may be obtained by oxidizing oleic acid with nitric acid. The true or solid acids only occur as constituents of animal and vegetable fats.

Prof. Miller makes a second group of fatty acids, of which oleic acid is the type, and which have the general formula $C_{2n}H_{2n-2}O_4$; but as oleic acid is the only member of this group which is of any practical importance, it is sufficient to refer the reader to the special article on that acid.

A complete list of even the chief fats and fixed oils would take up far more space than we can command. In the article "Fixed Oils," in *The English Cyclopædia*, the reader will find 64 of the most important of these substances mentioned, with, in most cases, a brief notice of the origin and properties of each. The British pharmacopœia contains hog's lard, mutton suet, cod-liver oil, concrete oil (or butter) of nutmeg, and almond, castor, croton, linseed, and olive oils, besides the closely allied substances spermaceti and wax.

The *Volatile* or *Essential Oils* exist, in most instances, ready formed in plants, and are believed to constitute their odorous principles. They form an extremely numerous class, of which most of the members are fluid; a few (oil of aniseed, for example) being solid at ordinary temperatures, but all of them are capable of being distilled without undergoing change. They resemble the fixed oils in their inflammability, in their solubility in the same fluids, and in their communicating a greasy stain to paper or any other fabric; but the stain in this case soon disappears, and they further differ in communicating a rough and harsh rather than an unctuous feeling to the skin. Their boiling points are in almost all cases far higher than that of water, but when heated with water they pass off with the steam—a property on which one of the chief modes of obtaining them depends. See PERFUMERY. The oils have characteristic penetrating odors, which are seldom so pleasant as those of the plants from which they are obtained, and their taste is hot and irritating. They vary in their specific gravity, but most of them are lighter than water, and refract light strongly. Most of them are nearly colorless when fresh, but darken on exposure to light and air; but a few are green, and two or three of a blue color. By prolonged exposure they absorb oxygen, and become converted into resins.

By far the greater number of them are products of the vital activity of plants, in which most of them exist ready formed, being inclosed in minute cavities, which are often visible to the naked eye. Although diffused through almost every part of a plant, the oil is especially abundant in particular organs of certain families of plants. In the *umbelliferæ*, it is most abundant in the seeds; in the *rosaceæ*, in the petals of the flowers; in the *myrtaceæ* and *labiatæ*, in the leaves; in the *aurantiaceæ*, in the rind of the fruit. As in the case of the animal and vegetable fats and fixed oils, so most of the essential oils occurring in plants are mixtures of two or more distinct chemical compounds, one of which usually contains no oxygen, while the others are oxidized. Of these, the former, which is a pure hydrocarbon, is the more volatile, and acts as a solvent for the others. Most of these oils, when cooled, separate into a solid and a fluid portion, to which the terms *stearopten* and *elæopten* have been applied.

In the comparatively few cases in which the oils are not formed naturally, they are produced by a species of fermentation, as in the case of oil of bitter almonds and oil of mustard (q.v.), while others are the product of the dry distillation or of the putrefaction of many vegetable bodies. Some of the natural oils, as those of cinnamon, spiræa, and winter-green, have also been artificially produced.

The essential oils are much employed in the fabrication of perfumery (q.v.), for the purpose of flavoring liquors, confectionary, etc., for various purposes in the arts (as in silvering mirrors), and in medicine. The special uses of the most important of these oils in medicine will be noticed subsequently.

The members of this group, which is an extremely numerous one (more than 140 essential oils being noticed in the article on that subject in the *The English Cyclopædia*), admit of arrangement under four heads. 1. Pure hydrocarbons; 2. oxygenoue essential oils; 3. sulphurous essential oils; 4. essential oils obtained by fermentation, dry distillation, etc.

1. The *pure hydrocarbons* are for the most part fluid, and have a lower specific gravity, a lower boiling point, and a higher refractive power than the oxygenous oils. They absorb oxygen, and are converted into oxygenous oils and resins. They may be separated from oxygenous oils, with which they are usually associated, by fractional distillation. They include oil of turpentine ($C_{20}H_{16}$), and the oils of bergamot, birch, chamomile, caraway, cloves, elemi, hop, juniper, lemons, orange, parsley, savine, and valerian, most or all of which contain the same hydrocarbon as oil of turpentine (q.v.), and in addition to it an oxidized compound; oil of copaiva ($C_{30}H_{24}$), attar of roses ($C_{16}H_{16}$), etc.

2. The *oxygenous essential oils* may be either fluid or solid, the latter being also termed *camphors*. A stearopten separates from most of the fluid oils on cooling. They are more soluble in water and spirit of wine than the pure hydrocarbons. They may be divided into (1) those which are fluid at ordinary temperature, such as those of anise-seed, chamomile,* cajeput, caraway,* cinnamon, cloves,* fennel, lavender, peppermint, rue, spiræa, thyme,* winter-green, etc. Those marked with a (*) are associated with the pure hydrocarbons already described. (2) The camphors, such as ordinary camphor ($C_{20}H_{16}O_2$), Borneo camphor ($C_{20}H_{18}O_2$), etc.

3. The *sulphurous essential oils* are chiefly obtained from the *cruciferæ*. They probably all contain the radical *allyl* (C_6H_5). The oils of garlic and of mustard (both of which have been described in special articles), and those of horse-radish, scurvy-grass, and asafœtida, are the best illustrative of this division

4. Among the essential oils obtained by fermentation, dry distillation, etc., may be mentioned the oils of bitter almonds and of black mustard, the oils of milfoil, plantain, centaury, etc. (whose leaves have no smell until they have been moistened for some time with water, when a kind of fermentation is set up, and oil is yielded in abundance), furfuramide (q.v.), etc.

The British pharmacopœia contains the essential oils of anise, cajeput, caraway, chamomile, cinnamon, cloves, copaiva, coriander, cubebs, dill, juniper, lavender, lemon, nutmeg, peppermint, pimento, rosemary, rue, savine, spearmint, and turpentine. Of these the oils of anise, cajeput, caraway, chamomile, coriander, dill, peppermint, pimento, and spearmint are used as stimulants and antispasmodics in cases of flatulence, griping, etc.; and to disguise the nauseous taste of various medicines. The oils of cajeput, cinnamon, and rue act similarly but more powerfully. The oils of copaiva and cubebs act in the same manner as the substances from which they are derived; oil of juniper is a powerful diuretic, and oil of savine (and to a less extent oil of rue) an emmenagogue. The oils of lavender and lemon are used to conceal the smell of sulphur ointment, and to give an agreeable odor to lotions, etc. The oil of rosemary is chiefly employed as a stimulating liniment, especially in cases of baldness; and the oil of nutmeg is seldom given medicinally except in the form of aromatic spirit of ammonia, into the composition of which it enters.

A very admirable paper on the essential oils was read Dr. Gladstone before the chemical society, in the month of Dec., 1863; and the reader who is anxious to pursue the subject further will find it advantageous to refer to this excellent production.

Bland oils—such, for example, as olive-oil—were much used by the ancients as external applications in various forms of disease. Celsus repeatedly speaks of the use of oil applied externally with friction in fevers, and in various other diseases. Pliny says that olive-oil warms the body and at the same time cools the head, and that it was used with these objects previously to taking cold baths. Aretæus recommends a sitz-bath of oil in cases of renal calculi, and Josephus relates that a similar mode of treatment was employed in the case of Herod. Galen prescribed "oil and wine" for wounds in the head; and the parable of the good Samaritan affords additional evidence that this was a common mode of treating wounds. The use of oil preparatory to athletic exercises is referred to by numerous Greek and Latin writers.

As a cosmetic—that is to say, as a means of giving to the skin and hair a smooth and graceful appearance—its use has been prevalent in hot climates from the earliest times. There is abundant historical evidence of this usage of oil amongst the Egyptians, the Jews, the Greeks, and the Romans; and Pliny's statement that butter is used by the negroes, and the lower class of Arabs, for the purpose of anointing, is confirmed by the observation of all recent African travelers. In hot climates there is doubtless a practical as well as an æsthetic object in anointing. The oil, being a bad conductor of heat, affords a certain amount of protection against the direct action of the solar heat; it is likewise serviceable as a protection against the attacks of insects, and as a means of checking excessive perspiration. The fact of oily and fatty matters being bad conductors of heat, serves also to explain why the Esquimaux and other dwellers in Arctic regions have recourse to the inunction of the blubber, etc. In their case the oily investment serves to prevent the escape of the bodily heat.

The Greeks and Romans not only employed oil for the purposes already mentioned, but in their funereal rites: the bodies of their dead being anointed with oil, with the view probably of postponing incipient decomposition. A similar practice existed amongst the Jews, and in the Gospels we find various passages in which our Lord referred to his own body being anointed by anticipation. It appears from the evidence of St. Chrysostom, and other writers, that this ancient usage of anointing the bodies of the dead was long retained in the Christian church. See UNCTION; EXTREME UNCTION.

In conclusion we may remark that the ancient system of anointing as a means of medical treatment, has to a certain extent been revived in modern times. Many physicians of the present day combine the inunction of cod-liver oil with its internal administration, a combination first recommended by professor Simpson of Edinburgh; and sir Henry Holland advocates the practice of anointing the harsh, dry skin of dyspeptic patients with warm oils. There can, we think, be little doubt that there are many forms of disease in which the local application of medicinal oils would prove advantageous; but the great drawback to their use is that the time required for properly rubbing them into the skin is more than most patients are willing to concede. For much curious information on the subject of this article, the reader is referred to a very interesting paper by Mr. Hunter, "On the External Application of Oils," in the second volume of *The Edinburgh Medical and Surgical Journal*.

OILS IN THEIR COMMERCIAL RELATIONS.—The solid animal oils found in commerce are butter and lard, tallow, mares' grease, goose grease, neats-foot oil, and unrefined yelk of egg oils. The two first are fully described under their names. See BUTTER, LARD. Tallow is the fat of oxen and sheep, but more especially the fat which envelops the kidneys and other parts of the viscera, rendered down or melted. The qualities of this solid oil render it particularly well adapted for making candles, and until the end of the first quarter of the present century, candles for ordinary use were almost wholly made of it, the high price of wax and spermaceti preventing their employment except by the most wealthy and for ecclesiastical purposes. Besides its use in making candles, tallow is most extensively used in the manufacture of soap, and for the purpose of preserving machinery from rust. The trade in tallow with Russia, which produces the best, and with North and South America, and even with India and other countries is very considerable; but it is declining, owing of course to the extension of gas and the enormous development of the paraffin, and petroleum oils (q.v.), and other light-giving materials. The quantities of tallow and stearine imported in five recent years into Britain were as follows:

	Tons.	Value.
1871	1,247,064	£2,996,258
1872	1,232,144	2,792,570
1873	1,527,821	8,847,271
1874	1,155,248	4,172,118
1875	967,396	4,838,166

The chief use of tallow in this country is now in the manufacture of soap (q.v.), and even in this it has yielded in importance to palm and cocoa-nut oils.

Mares' grease is not nearly so solid as tallow; it is a yellowish-brown grease, imported extensively from Monte Video and Buenos Ayres, where vast numbers of horses are slaughtered for their hides, bones, and grease; it is particularly valuable as a lubricant for machinery, and is chiefly employed for that purpose after much of its stearine has been removed for candle-making. The reason this material is called *mares'* grease is said to be from the circumstance that in South America horses are chiefly used alive, and mares are slaughtered as comparatively useless. Goose grease is another soft fat, much valued by housewives for many purposes, but excepting that it is sold in some districts as a remedial agent, it has no commercial importance. Neats-foot oil is a soft fat procured in the preparation of the feet and intestines of oxen for food as sold in the tripe-shops. The quantity obtained is not very great, but it is in much request by curriers for dressing leather. Yelk of egg oil is a hard oil, which, though little known in Britain, is extensively used in other countries where eggs are cheaper. In Russia, for instance, it is manufactured on so large a scale as to supply some of the largest makers of fancy soaps, and it forms the principal material in the celebrated Karan soap; and certain pomades are made of it which have a great reputation, and realize very high prices. This oil is not unlike palm-oil in color and consistency; but when refined is liquid, and has a reddish-yellow color. Its price at Moscow is as high as 8s. per lb.

The liquid animal oils are more numerous, and, excepting tallow, are far more important, the so-called fish-oils being the principal. These are whale, porpoise, seal, cod, herring, shark, etc. The whales which are pursued for their oil are: 1. The sperm whale. This huge creature is from 60 to 70 ft. in length, and yields generally from 5,000 to 6,000 gallons of oil. The finest oil is taken from the great reservoir on the head. The oil of this species is all of a quality superior to others, and is known as sperm oil. For the method of procuring this oil, see Cachalot. 2. The right whale, which yields by far the largest proportion of whale oil. This, with that yielded by other less important species, is usually called train oil. The term *train* is supposed to be a corruption of *drain*, and applies to the circumstance of the oil being drained out of the blubber; and in this sense it is also applied to sperm oil from the blubber of the cachalot, in contradistinction to the finer oil from the head matter. The right whale forms the chief object of the northern fisheries, but other species of balæna are pursued in different parts of the world for the sake of their oil. See Whale.

Amongst the smaller cetaceans, the porpoises—called also dolphins ("puffydunters" on the east coast of Scotland)—and grampuses yield an excellent oil, second only in value to that of regular oil whales; and to obtain it, large numbers are occasionally killed in the British seas. The price of sperm oil ranges from £80 to £95 per tun, and that of ordinary train oil from £40 to £45 per tun of 252 gallons. The imports and consumption of the various kinds of whale oil for the five years 1871 to 1875 were as follows:

	Tuns.	Value.
1871	24,679	£1,067,784
1872	18,719	855,590
1873	17,886	766,927
1874	17,051	751,859
1875	19,359	917,701

A large quantity of very valuable oil is obtained from seals; and the seal-fishery, as a means of obtaining oil, is only second in importance to that of the whale. It is carried on chiefly on the shores of Newfoundland, Greenland, and Labrador. Like the whales, the seals have a thick layer of blubber in which the oil is contained. See Seal. The first draining from the blubber is of a fine, clear, pale straw-color; the next, yellow or tinged; and the last is brown or dark. The price ranges in our markets at about £35 to £40 per tun for pale, £30 to £35 for yellow, and £28 to £30 for brown. The whale and the seal oils are nearly all used for burning in lamps, and for this purpose they are admirably adapted by their great illuminating power. They are also the best lubricants for machinery.

Of the true fish oils, that from the cod is first in importance, more especially since its medicinal properties were discovered. It is made only from the liver of the fish; and the attempt which was made to induce a popular belief that the so-called cod-liver oil was different from the ordinary cod oil of commerce, was simply a cheat; no difference exists, and the oil is obtained just as good from the oil merchant at a moderate price per gallon as from the empiric at an exorbitant price per pint. Indeed, the purer the oil can be got, the better it is in a remedial point of view, notwithstanding the efforts made to convince the public that a certain color is better than any other.

Instead of the old and somewhat rude methods of preparing the oil (see COD-LIVER OIL), much more complete and efficient arrangements are now adopted. The livers, when taken from the fish, are all examined, washed in clean water, and placed in sieves to dry. Thence they are transferred to pans heated with steam, and after being exposed to a gentle heat for about three-quarters of an hour, the heat is discontinued; and when cold, the oil which has separated is skimmed off, and strained through flannel bags into tubs. Here certain impurities subside, and the clear oil is poured off from the dregs, and the contents of numerous tubs are transferred to galvanized iron cisterns, in which a further settlement takes place. The oil is now ready for the filters, which are made of the strong cloth called moleskin, through which it is forced by atmospheric pressure into the store-tanks, which are also of galvanized iron. Hence it is pumped into the casks for export, which are usually hogsheads, tierces, and barrels. The value of cod-liver oil is about £34 to £40 per ton. The imports vary much according to the success of the fishery; they have reached nearly 1000 tons per annum. Besides its consumption in lamps, and for medicinal purposes, cod oil is used in making some kinds of soap. Oil is occasionally made from the herring, but not in very great quantities; it, however, forms a commercial article. It is made from the whole of the fish, the smell of which it retains to a very disagreeable extent.

The lightest of all the fixed oils is made from the liver of the common shark; it ranges from specific gravity 0.865 to 0.867. This, and the oil made from the livers of the common skate (*Raia batis*), the Thornback (*R. clavata*), and the white skate (*Rhinobatus cerniculus*), are often substituted for the cod-liver oil used medicinally, but have not its valuable properties.

Under the name of lard oil, large quantities of the oleine of lard have been imported of late years from America. It is a secondary product, arising from the great manufacture of lard stearine for candle-making which has arisen in that country. Lard oil is worth about £45 to £53 per ton, and is principally used as a lubricant for machinery.

The solid vegetable fixed oils which find a place in commerce are palm oil, cocoa-nut oil, kokum or vegetable tallow, and carapa or carap oil. The palm oil is an oil of a bright orange-yellow color and an agreeable violet odor; it is obtained from the not very thick covering of the hard seeds of the oil-palm (q.v.). The fruits, when gathered, are shaken out of the clusters, and are laid in heaps in the sun for a short time, after which the natives boil them slowly in water, when the oil separates and is skimmed off the surface, and carried in small quantities to the depôts of the traders, who transfer it to casks which are prepared to receive it on board the ships. The quantity thus collected is enormous. The imports into Britain alone for the five years 1871–1875 were as follows, in tons weight: (1871) 52,394; (1872) 50,325; (1873) 50,897; (1874) 53,383; (1875) 45,228. Previous to 1840, the chief use of palm oil was in making soap, but it was about that time found that the palmitine or fat acid of this oil was admirably adopted for the manufacture of candles (q.v.); and since then it has become of much greater importance.

Cocoa-nut oil is a white fat, with the peculiar smell of the kernel; it is made by grinding or pounding the kernel of the cocoa-nut. After it has been boiled in water for a short time, the paste is submitted to great pressure, and a large quantity of milky juice is obtained; this is slowly boiled, and the oil separates and rises to the surface in considerable quantity, and is skimmed off. Twenty ordinary-sized nuts will yield as much as two quarts of oil. This oil is now very largely imported, and, treated in the same way as palm oil, forms a stearine, which greatly improves that of palm oil when mixed with it in proper proportions; neither does so well separately, and the consumption of cocoa-nut oil has consequently very greatly increased. Most of it comes from Ceylon, where the tree is largely cultivated on purpose. The imports in 1870 were 9,930 tons; in 1872, 21,469 tons; and in 1875, 10,957 tons. By far the greater proportion of this vast quantity is used by the candle manufacturers, and the remainder in making common soap, its disagreeable smell preventing it being employed for the better kinds.

Vegetable tallow, or kokum oil, is also used by the candle-makers; only small quantities, however, are imported. It comes from Singapore, and is produced from the seed of *Garcinia purpurea*, a species of the same genus with the mangosteen. Another kind of vegetable tallow is made in China, from the seeds of *Stillingia sebifera.*

Carapa, carap, crab, or Andiroba oil, is very extensively made in British Guiana and the West Indies, but it is nearly all used there, either as a pomade for preserving the hair, or as an unguent for rheumatism and neuralgic pains, for which purposes it is said to be very useful. See CARAPA.

The Bassia oil is beginning to attract attention, and several importations have taken place from India, and some rather large quantities have reached Liverpool from Bombay, under the name of Muohwa oil. This oil is of a soft butter-like consistence, and yellowish-green color, and is well adapted for soap-making, and for machinery grease. See BASSIA.

The liquid vegetable oils are very numerous, and several are of great commercial importance. First in rank is olive oil, made from the ripe fruit of the common olive (*olea Europea*). When good and fresh, it is of a pale greenish-yellow color, with scarcely any smell or taste, except a sweetish nutty flavor, much esteemed by those who use it.

The finest qualities are the Provence oil (rarely seen in Britain), Florence oil, and Lucca oil. These are all used for salads and for cooking. The Genoa is used on the continent for the same purposes; and Galipoli, which is inferior, constitutes the great bulk of what is received in this country for cloth dressing, Turkey-red dyeing, and other purposes; the continental soap-makers also employ it extensively. The high price of the best qualities leads to much adulteration with poppy and other oils, but it is generally pretty safe when in the original flasks as imported. The mode of obtaining the finest kinds is by gentle pressure of the fruit. The cake is afterwards treated with hot water, from the surface of which an inferior quality is skimmed. The Galipoli oil is obtained by allowing the olives to ferment in heaps, and then to press them in powerful oil-presses; the cake or *marc* is then treated with water once or twice, until all the oil is removed; this inferior oil is darker in color, being a yellowish or brownish green. We receive the finest from Italy, and the commoner qualities from the Levant, Mogador, Spain, Portugal, and Sicily. The present values range from £44 to £54 for common kinds, and the finest Lucca is £1 the half-chest, or nearly £85 per tun measure. The total quantity imported during the four years 1872–75 was as follows: 1872, 23,964 tuns; 1873, 35,121 tuns; 1874, 22,720 tuns; 1875, 35,453 tuns.

Nearly all the other liquid vegetable oils of this class are obtained from seeds, and as they are most of them treated in the same way, one description will suffice. First, the seeds are ground—and this in Britain is always done by vertical stones (see MILL)—into a kind of coarse meal, which is first warmed in pans, and then put in certain portions in woolen cloths or bags, so arranged as to be of uniform thickness; these are again wrapped in horse-hair cloths, and each parcel is placed between two flat boards slightly fluted on their inner sides, and then placed in the wedge press. In this *a, a* are two flannel bags filled with the meal and inclosed in horse-hair bags, each flattened between the flat boards, *b, b, b, b*. They are set upright, between the pressing-plates, *i, i, i, i*, one at each end of the press-frame, *ccc*, which is made of great strength, and often of cast-iron. Next is placed the wedge *d;* the other wedge, *e*, is then suspended by a cord in the position represented; *h, h* are then placed, as seen in the drawing; the main wedge, *g*, is lastly inserted, and the press is ready for action. The operation is very simple; a heavy wooden stamper, from 500 to 600 pounds weight, is raised by machinery about two feet, and allowed to fall upon the wedge *g*. This tightens all the other wedges and pressing-plates, and exerts a pressure of about 60 tons on each bag when fully driven home. The pressing-plates, *i, i, i, i*, are pierced with holes, and so are the plates *b, b, b, b;* and through these holes the oil trickles and passes away through a pipe at the bottom.

One of the chief seed oils is that of linseed (q.v.). Very little linseed oil is imported into Britain; the improved machinery, and the great demand for the oil-cake (see OIL-CAKE), causes it to be manufactured at home, and at present it is exported in considerable quantities; thus, from Hull alone there was exported in 1875, of seed-oil, expressed chiefly from foreign seed, no less than 6,846,725 gallons, and over 10,000 tons of oil-cake; and from London and Liverpool together about the same quantity. The total production of Great Britain for 1868 was estimated at 65,000 tons; for 1869, 61,000 tons; for 1871, 69,000 tons; and for 1872, 67,000 tons. In 1875, 15,628,316 gallons of seed-oil were exported. It is worth about £36 per ton. Rape or colza oil is a name which covers the product of several cruciferious seeds, as rape, turnip, and other species of *brassica*, radish, *sinapis toria*, gold of pleasure, etc. The oil is clear brown and usually sweet, but with a mustard-like flavor; its illuminating powers are excellent, and it is also well adapted for wool-dressing. Very large quantities are made in Great Britain, chiefly from *sinapis toria* and other Indian mustard seeds, which are imported under the name of Surzee seed. The imports of these seeds are occasionally as much as 60,000 quarters per annum. Hemp seed yields a green oil which is much used in making soft soap, especially in Holland. In Russia it is eaten with various kinds of food, and is greatly liked by all classes.

The following are the names of a number of oils which are more or less used in this country: Cotton-seed oil. Palm-nut oil, a cleared limped oil from the hard nut of the oil-palm; this nut was formerly rejected as useless after the oil had been obtained from the fruit. Safflower-seed oil, from the seeds of *carthamus tinctorius;* it constitutes the real Macassar oil. Sunflower-seed oil, from seed imported from the Black sea provinces of Russia; a rapidly increasing trade is springing up in this excellent oil. Poppy-seed oil, from the seed of *papaver somniferum*, largely imported from India; it is as sweet as olive oil, and is extensively substituted for it, especially in France, where it is also very largely cultivated. Gingelli-seed oil, from the seed of *sesamum orientale*, an important Indian staple of which we are large consumers; the oil is much used for wool dressing, etc. Ground-nut oil, from the seeds of *arachis hypogœa*, imported from western Africa and India; this oil is particularly adapted for fine machinery, as it is not affected by cold. Niger, til, or teel-seed oil, from the seeds of *Guizotia oleifera*, much imported from Bombay. Croton oil, from the seeds of *jatropha curcas*, largely used in wool dressing. The croton oil used in medicine is from *croton tiglium*, of which only small quantities are imported; whereas of the other 1200 or 1400 tons, besides a quantity of the seed, often reach us in one year. Another highly valuable medicinal oil, castor oil (q.v.), is of great commercial importance. Almond oil, chiefly used for perfumery purposes, is made from the kernels of the sweet and bitter almond; it is the most free from flavor and odor of any oil in use, notwithstanding that the essential oil of bitter almonds is so strongly flavored.

Oils made from the seeds of the following plants have some commercial value in other countries: *Madia setiva; argemone Mexicana;* various species of gourds: garden cress (*lepidium sativum*); tobacco, now extensively used in southern Russia, Turkey, and Austria; hazel-nuts; walnuts; nuts of stone pine; pistachio nut; tea-seed; this in China is a common painter's oil; the grape, from the seeds or stones, as they are called, saved from the wine-presses, used in Italy; Brazil-nuts (*Bertholetia excelsa*); *calophyllum inophyllum*, called pinnacottay oil in India; *melia azadirachta*, called in India by the names neem and margosa oil; *aleurites triloba*, called in India country almond oil, and much used for burning in lamps and torches; *psoralea corylifolia*, called baw-chee-seed oil. The seed is sometimes imported to this country for pressing. Ben-seeds (*moringa pterygosperma*); bon-duc-nuts, the seeds of *guilandina bonduc* and *G. bonducella.*

The following oils, new to European commerce, were shown in the international exhibition of 1862. *India.*—Teorah oil, from the seeds of *brassica erucastrum;* capala oil, from the seeds of *rottlera tinctoria;* cardamom oil, from the seeds of *elettaria cardamomum;* hidglee badham oil, from the seeds of *anacardium occidentale*, or cashew-nut, now largely cultivated in India; cassia-seed oil; chaulmoogra oil, from the seeds of *hydnocarpus odorata;* cheerongee oil, from the seeds of *Buchanania latifolia;* chemmarum oil, from the seeds of *amoora rohituka;* Circassian-bean oil, from the seeds of *adenanthera pavonina;* hoorhoorya oil, from the seeds of *Polanisia icosandra;* custard apple-seed oil, from the seeds of *anona squamosa;* exile oil, from the seeds of *cerbera thevetia;* monela-grain oil, from the seeds of *dolichos uniflorus;* kanari oil, from the seeds of *Canarium commune;* khaliziri oil, from the seeds of *vernonia anthelmintica;* malkungunnee oil, from the seeds of *celastrus paniculatus;* bakul oil, from the seeds of *mimusops elengi;* rana oil, from the seeds of *mimusops kaki;* moodooga or pulas oil, from the seeds of *butea frondosa;* nahor or nageshur oil, from the seeds of *mesua ferox;* hone-seed oil, from seeds of *calophyllum calaba;* poonga, caron, or kurrmig oil, from the seeds of *pongamia-glabra;* vappanley oil, from seeds of *Wrightia antidysenterica;* babool oil, from seeds of *accasia Arabica;* gamboge oil, from seeds of the gamboge tree (*garcinia pictoria*); coodiri oil, from the seeds of *sterculia fœtida;* kikuel oil, from the seeds of *salvadorea persica;* marotty, surrate, or neeradimootoo oil, from the seeds of *hydnacarpus inebrians;* and pundi-kai oil, from the nutmegs of *myristica malabarica.*

From Brazil.—Oils from the seeds of *feuille cardifolia. F. monosperma, anisosperma passiflora, cucurbita citrullus, mabea fistuligera, anda gomesii. myristica bicuhiba, carpotroche Braziliensis, dipterix odorata, theobroma cacao, acrocomia sclerocarpa, nectandra cymbarum*, and from the fat of the alligator and the tapir, all for medicinal and perfumery purposes; and oils from the seeds of *œnocarpus bacaba, Œ. pataud, caryoca Braziliensis*, and *Euterpe edulis*, used for culinary and lighting purposes.

From British Guiana.—Oil drawn from the stem of *oreodaphne opifera;* it resembles refined turpentine, and is suggested as a solvent for india-rubber. Wallaba oil, from the wood of the wallaba tree (*eperera falcata*), medicinal.

The preparation of the essential oils is treated of under PERFUMERY.

The importance of the manufacture of oils is very great; in 1875 the value of the imports of the leading staples of this trade—viz., fish, palm, cocoa, and olive oils—was no less than £4,012,901. The aggregate of the other kinds was £2,471,590. In addition, oil seeds to the value of over £6,500,000 are imported for crushing in Great Britain; whilst the exports of oil amount in value to about £1,600,000. Thus, it will be seen that this trade represents a capital of above $14,000,000 sterling. See OIL-WELLS and OIL-TRADE.

OIL-WELLS AND OIL-TRADE. One of the most remarkable trades, suddenly sprung up into importance in modern times, is that in oil obtained from subterranean sources. See NAPHTHA.

It is now known that oil-bearing mineral beds exist in various parts of America, as well as in the older continent; but the richest deposit hitherto discovered is in the United States, in Venango co., at a spot in Pennsylvania not far from the point of junction of that state and New York state with lake Erie. Oil had for many years been seen floating on the surface of the water of a well near Titusville; it was taken up by absorption by means of flannel, and applied to medicinal purposes. Dr. Brewer, in 1853, suggested that it might possibly be used for lubricating and for illumination; and in the following year was formed the Pennsyvania rock-oil company. This company languished until 1858, when col. Drake, manager of the company, and Mr. Bowditch, resolved to sink a well purposely for oil. They were amply rewarded, for oil was pumped up at a rate varying from 400 to 1000 gallons daily. The news being spread abroad, adventurers quickly came to the district, which obtained the names of Oil Creek and Petrolia; and they experienced every degree of fortune from utter failure to splendid success. By 1860 it was known that oil existed beneath 100 sq.m. of country, at a depth varying from 70 to 500 feet. In 1861 the first large *flowing* well was struck—that is, a well up which the oil rose so profusely as to flow over the surface, yielding 1000 barrels (of 40 gallans each) per day. "No mining enterprise had ever offered such sudden fortunes. A well costing a few thousand dollars might yield from 100 to 2,000 barrels of oil daily with no expense for pumping. The Noble well yielded, in little more than one year, 500,000 barrels of oil. The Sherman flowed 450,000 barrels in about two years."

At first the uncertainty in this trade was something extraordinary. On one occasion a well was bored with the usual centerbit to a considerable depth without any oil being found. On withdrawing the bit, and putting in the rimer or rimmer to widen the hole, a vein was struck at the side. The bit had just missed the vein, and the well would have been a failure had not the orifice been enlarged. This incident gives meaning to a phrase much used in America—that of "striking oil." Another well was bored, flowing a large amount of oil; but by the time the owner had built tanks to collect it, the oil had altogether disappeared. The deepest well sunk in the district, more than 1000 ft., yielded no oil whatever; and altogether only 15 per cent of the borings were successful.

When the oil began to be sent in large quantities to New York and other towns, the cheapness of price led to its application as lamp oil, and in many other ways; the increasing demand brought the price up again to a reasonable figure at Petrolia; and the price induced the sinking of new wells. Small villages rose into large towns, with banks, hotels, and wealthy people, all, however, begrimed with oil. Titusville, which had 243 inhabitants in 1855, rose to nearly 9,000 in 1870. Oil city has now become a town of great importance. The new oil exchange is a handsome building, providing amply for the requirements of "the most important petroleum market in the world."

The following table shows the production of petroleum in 1870:

	Gallons.	Value in Dollars.
Kentucky	4,000	650
Ohio	2,038,543	228,488
Pennsylvania	171,207,622	18,045,967
W. Virginia	8,013,340	1,029,119
Total	181,263,505	19,304,224

The production for the year ended June, 1878, had risen to the enormous figure of 619,000,000 gallons. The exports were about 66 per cent of the production, and were valued at $46,574,970. In 1876 it was estimated that 20,000 oil-wells had been dug in Pennsylvania and West Virginia, at a cost of $192,000,000. They have yielded oil to the value of $300,000,000 at the wells, or rather more than $400,000,000 at the sea-board. An important new oil district has been discovered at Bradford, in McKean co., Penn.

In Canada there are four areas in which oil-springs are found—two in Enniskillen, a third in Mosa and Oxford townships, and a fourth in Tilsonburgh. The Canadian oil is more troublesome to purify than that found in the States. Although it occurs abundantly, the production in 1878 was not more on the average than 1200 barrels per day. As explained under NAPHTHA, natural petroleums and the paraffin oils distilled from shale or coal very closely resemble each other, so that both kinds are used for the same purposes. In Scotland the paraffine-oil industry is an important one, yielding not much less than 30,000,000 gallons of crude oil annually, from which solid paraffin and other products are obtained as well as lamp oil. See SHALE. In Prussian Saxony the same or very similar products are distilled on nearly as large a scale from an earthly lignite found in the brown coal formation between Weissenfels and Zeitz. In Galicia, chiefly in the Boryslaw district, there are both a native oil and a native bitumen (ozokerite) found, which in 1873 yielded burning oil and paraffin to the value of nearly £500,000, and the industry is still prospering. There appears to be also a considerable supply of petroleum or rock-oil in Roumania.

In 1865 a shale was discovered in New South Wales, similar to the Boghead coal or Torbanehill mineral of Scotland, but richer in oil, and more free from sulphur. When distilled at Sydney, from 100 to 160 gallons of oil were obtained from one ton of shale. The seam in Hartley district is 5½ ft. thick. Of this substance the South Wales shale and oil company raised 15,598 tons in 1876, valued at £46,794; and there appears to be an extensive deposit of it in the district. These shale-oil industries are held in check by the low price at which American petroleum is usually sold; and in July, 1879, it was lower than it had ever been, namely 6½d. per gallon in the refined state in the London market.

OIRIR-GAEL, a name which, in the early times of Scottish history, was applied to the Gaels of the coasts, in contradistinction from the Gall-Gael or islesmen. There was long a struggle for superiority between these two races, represented respectively by Somerled of the isles and the later kings of Man, in which the latter were eventually successful, uniting under one head the dominion of Argyle and the Isles.

OISE, a river of France, one of the chief affluents of the Seine, rises in the vicinity of Rocroy, in the n. of the department of Ardennes, and flows s.w., joining the Seine at Conflans-Sainte-Honorine, after a course of 150 m., for the last 75 of which it is navigable. The fall of the river is very gradual, and its course is extremely sinuous. It is connected by canals with the Somme, the Sambre, and the Scheldt, and forms one of the chief commercial routes between Belgium and Paris. It becomes navigable at Chauny.

OISE, a department in the n. of France, is bounded on the e. by the department of Aisne, and on the w. chiefly by that of Seine-Inférieure, which intervenes between it and the English channel. Area, 2,250 sq.m., of which two-thirds are in arable land; pop. '76, 401,618. The principal rivers are the Oise—from which the department derives its name—and its tributaries the Aisne and Therain. The department is almost wholly included in the basin of the Oise; and as the course of that river indicates, the surface—consisting for the most part of extensive plains—has a general slope toward the s.w. The soil is in general fertile, and agriculture is well advanced. The products are the usual grain-crops, with an immense quantity of vegetables, which are sent to the markets of the metropolis. The department is divided into the four arrondissements of Beauvais, Clermont, Compiègne, Senlis; capital, Beauvais.

OITI, *Moquilea tomentosa*, a tree of the natural order *chrysobalanaceæ*—by many botanists regarded as a suborder of *rosaceæ* (q.v.)—a native of the n. of Brazil, and valuable on account of its timber, which is very good for ship-building.

OJE'DA, Alonso de, 1465–1510; b. Spain; came to America with Columbus in 1493. He conducted an exploring expedition through Santo Domingo, and a second one through the Vega Real. In 1499 he left Spain at the head of a new expedition, in which Amerigo Vespucci joined him. On this voyage he discovered Venezuela, which he named. In 1501 he again set sail from Spain with Vespucci, and this time he discovered the gulf of Uraba. He went back to Spain in 1508, and, having been granted the territory of Nueva Andalucia, the modern Colombia, he brought over a colony of 300, one of whom was Francisco Pizarro. He laid the foundations of a town called San Sebastian on the gulf of Darien, and, going to Hispaniola soon after for supplies and re-enforcements, was imprisoned by the owner of the ship in which he sailed. Transported to Cuba, he spent some years in fighting the Indians. He finally returned to Hispaniola exhausted by hardships, and soon died there.

OJIBWAYS, or Chippewas, a tribe of North American Indians of the Algonquin stock inhabiting the states of Michigan, Wisconsin, Minnesota, and the shores of lake Huron and lake Superior, with a rendezvous at La Pointe. They were discovered by the French about 1640, to which nation they were friendly, but continually at war with the Sioux. They were also allies of Pontiac, the great fighting chief of the Ottawas. When first discovered they were domiciled at Sault Ste. Marie, deriving the name of *Sauteur* from that place, by which they are still known to the Canadians. They have the customs of the Algonquins; they are brave and never knew defeat in their wars with the Foxes, Sioux, or Iroquois, their constant enemies. War had thinned their ranks, and in 1660 there were only 550 at the Sault. During the revolutionary war they were on the side of the British, but came over to the side of the colonists in 1785–89, turned against them subsequently and joined the Miamis, but again made peace in 1795. In 1805 they gave up nearly all their possessions as far e. as lake Erie. In the war of 1812 they were hostile, but in 1816 participated in the general treaty of the tribes, and in 1817 gave up all their lands in Ohio. In 1851 all but a few roving bands had been removed w. of the Mississippi and had ceded all their lands to the government except small reservations. The bands living near lake Superior and in Michigan are generally peaceable and industrious. Those w. of the Mississippi still have extensive tracts of land, amounting to more than 5,000,000 acres as established by treaties 1854–67. In 1872 the government owed them $750,000. In 1871 there were 1974 of this tribe in different parts of Canada, 1502 on the n. shore of lake Superior, and some scattering or living with other tribes. Missionaries have not been appreciated, the majority still clinging to their idols, although Roman Catholic and Protestant missions are still maintained. They believe in Kitchie Manitou, the great or good spirit, and Matchie Manitou, the evil spirit. Their priests are called medas. Their principal occupation is making mats and hunting and fishing; they have no taste for agriculture or hard work of any kind. They speak the language of the Algonquins which is found in Eliot's Indian Bible, but in their use it is so intermixed with others that few original dialect forms remain. There are a dictionary and grammars by bishop Baraga and the rev. G. A. Belcourt, and treatises by Schoolcraft and others. A newspaper is printed in their language; and in 1851 George Copway, a native Ojibway wrote a *Traditional History of the Ojibway Nation*, and in 1861 Peter Jones of the same tribe was the author of a *History of the Ojibway Indians*.

O'KA, an important commercial river of central Russia, the principal affluent of the Volga from the s., rises in the government of Orel, and flows in a generally n.e. direction, forming a common boundary between the governments of Tula, Kaluga, and Moscow; and afterwards flowing through the governments of Riazan, Vladimir, and Nijni-Novgorod. It joins the Volga at the city of Nijni-Novgorod, after a course of 887 miles. Its basin, estimated at 127,000 sq.m. in extent, comprises the richest and most fertile region of Russia. The principal towns on its banks are Orel, Beleff or Bielev, Kaluga, Riazan, and Murom; the most important affluents are the rivers Moscow, Kliasma, and Tzna. During spring, the Oka is navigable from Orel to the Volga; but in summer the navigation is obstructed by sand-banks. It communicates with the ports on the Baltic, Caspian, and White seas; and the cargoes annually shipped down the river amount in value to several million pounds sterling.

OKANA'GANS, an Indian tribe, belonging to the Shushwap division of the Selish family, and living about the Okanagan river in Washington territory. They are semi-civilized, and have made some advances in agriculture. Their number is about 800.

O-KEE-CHO'-BEE, a lake bordering on the Everglades of southern Florida (see Florida), about 120 m. in circuit, receiving several small rivers, and having for its outlet the river Caloo-sa-hatchee, which flows westerly into the gulf of Mexico.

OKEECHO'BEE, Lake (*ante*), s. of Brevard co., Fla., between Manatee co. and the Everglades; is about 35 m. in its greatest and 25 m. in the shortest diameter; about 1200 sq.m.; there are many inlets, of which the Kissimee river is the largest; the waters are drained off into the Everglades, but there is no outlet of any size. The region about is wild and made up of swamp and jungle. Alligators and poisonous snakes abound. There are a few small islands in the lake, on which it was formerly believed that there were ancient ruins, but this report is now discredited.

O'KEEFE, John, 1747–1833; b. Ireland; began to study painting when six years old with West, of the Royal Irish academy. At 16 he wrote a comedy, and at 18 a play of his was produced at Dublin. Soon after he joined a theatrical company, and wrote a number of small pieces, in which he appeared at his own benefits. His *Tony Lumpkin in Town* was produced at the Haymarket, London, in 1778, and gained for its author an English reputation. He settled in London, and though threatened with blindness, continued to write for the stage. His dramatic pieces number 68, and of these 56 were played on the stage; and some of them, such as the operatic farces, *The Highland Reel*, and *The Agreeable Surprise*, and the farce *Wild Oats*, are still seen on the stage. He stopped writing in 1798, when he had become almost totally blind. For some years afterward he was in straitened circumstances, till he was relieved by a pension from the crown. He published in 1826 *Recollections of the Life of John O'Keefe, written by Himself*. A collection of his pieces in verse was published in 1834 under the title of *O'Keefe's Legacy to his Daughter*. He was himself a Roman Catholic, but his son became a clergyman in the English church. His works are deficient in characterization and incident, and rough in diction, but full of broad humor and rollicking spirits.

OKEFINO'KEE SWAMP, in Baker co., Florida, and Ware, Clinch, and Charlton counties, Ga. It covers an immense region, comprising many great forests and lakes.

O'KELLY, James, 1757–1826; of Irish birth; a noted pioneer preacher in the Methodist Episcopal church, and the leader in the first secession from it. He became a local preacher, and the people flocked to hear him. In 1778 he was admitted among the traveling ministers, and soon became prominent for earnestness and fervor. At the organization of the church in 1784 he was ordained as an elder. One of his contemporaries speaks of him as "laborious, zealous, given to prayer and fasting, ... and hard against negro slavery in private and from the pulpit and press." His labors and influence were confined chiefly to the southern counties of Virginia and the border counties of North Carolina. In 1790 he began to show dislike to what he thought the growing power of bishop Asbury, and called on him privately to suspend his episcopal functions for one year, if he did not wish to be publicly opposed. As this menace produced no effect he made the movement in the conference of 1791 that resulted in the withdrawal of himself and a few others from the church. At first they called themselves the republican Methodists, but afterwards changed their name to the Christian church. This company was soon divided and subdivided until only a few broken societies remained. O'Kelly lived many years, witnessing through them the failure of his plans. He saw his followers forsaking him and returning to the church which they had left. But he clung to his convictions to the last. See Methodist Episcopal Church, Divisions in.

OKEN (originally Ockenfuss), Lorenz, a celebrated German naturalist, was b. at Bohlsbach, in Würtemberg, Aug. 1, 1779. He studied at Würzburg and Göttingen; became extraordinary professor of medicine at Jena in 1807, where his lectures on natural philosophy, natural history, zoology, comparative anatomy, vegetable and animal physiology, attracted much notice. In 1812 he was appointed ordinary professor of natural science; and in 1816 commenced the publication of a journal partly scientific and partly political, called *Iris*, which continued to appear till 1848. The opinions promulgated in the *Iris* led to government interference, and Oken resigned his chair, and became a private tutor, devoting his leisure to the composition of works on natural history. In 1828 he obtained a professorship in the newly-established university of Munich, but in 1832 exchanged it for another at Zürich, where he died, Aug. 11, 1851. Oken aimed at constructing all knowledge *à priori*, and thus setting forth the system of nature in its universal relations. The two principal works in which this idea is developed are his *Lehrbuch der Naturphilosophie* (Jena, 1808–11), and his *Lehrbuch der Naturgeschichte* (3 vols. Leip. 1813–27). The former has been translated into English, and published by the Ray society under the title of *Elements of Physio-philosophy*. As Oken's philosophic system of nature was very peculiar, and quite unlike anything that had preceded it, Oken invented a nomenclature of his own, which, however, in many cases is forced and pretentious, composed for the most part of new-coined words, and difficult to remember. It therefore found little favor, and Oken was long regarded—particularly by French and English savans—as a mere dreamer and transcendental theorist; nor can it be denied that he is largely such, infected with the worst vices of the school of Schelling, to which he belonged; but some of his "intuitions"—if we may so term his scientific suggestions—were remarkably felicitous, and in the hands of rigorous demonstrators, have led to great results. In his work *Die Zeugung* (On Generation, Bamb. 1805), he first suggested that all animals are built of vesicles or cells; in his *Beiträge zur vergleichenden Zoologie, Anatomie und Physiologie* (1806), he pointed out the origin of the intestines in the umbilical vesicle; and in the same year lighted accidentally upon the idea, since so prolific of results, that the bones of the skull are modified vertebræ. On account of this discovery he has been termed "the father of morphological science." That Oken, and not Göthe, was the original discoverer of the vertebral relations of the skull, has been conclusively shown by Owen, in a valuable notice of Oken in the *Encyclopædia Britannica*.

OKHO'TSK, SEA OF, an extensive inlet of the n. Pacific ocean, on the e. coast of Russian Siberia. It is bounded on the n. by the wastes of Siberia, on the e. by the peninsula of Kamtchatka, and is partially inclosed by the Kurile islands on the s., and by the island of Saghalien on the west. It is 1000 m. in length, and 500 m. in breadth. The river Ud, which enters it on the n., is 400 m. in length. Owing to climate and position the sea of Okhotsk is unlikely ever to become the scene of much commerce. On its northern shore, at the mouth of the Okhota—from which it derives its name—is the small seaport of Okhotsk, lat. 57° 21′ n., long. 143° 17′ east. This town has only 236 inhabitants, and has been entirely superseded by the ports of Ayan and Nikolayevsk.

OKRA, or OCHRO. See HIBISCUS, *ante*.

OKTIBBEHA, a co. in n.e. central Mississippi, watered by the Noxubee and Oktibbeha rivers, traversed by a branch of the Mobile and Ohio railroad; about 500 sq.m.; pop. '80, 15,977—10,870 colored. The surface is level, and heavily wooded. The soil is fertile. The principal productions are corn, cotton, and pork. Co. seat, Starkville.

OKUBO, TOSHIMICHI, a Japanese statesman, b. in the province of Satsuma about 1830. As a member of the proudest of the Japanese clans, he was nurtured in the traditions of exclusivism and undying jealousy of and hatred towards the tycoons of Yedo. His sympathies were early enlisted in that literary movement, whose goal was the restoration of the ancient undivided power of the mikado. Going to Kioto he cultivated the friendship of those court nobles possessed of political capacity, and those patriotic students, who with himself finally overthrew the dual system of government. At the bombardment of Kagoshimi by the British fleet in 1864, he served in one of the batteries as a defender of the city. In 1868, having pushed forward the secret plans of the revolutionary coalition at Kioto, he precipitated the crisis of six hundred years, and stepped into the front rank of leaders in the new government. He urged the unfurling of the mikado's brocade banner which stamped the tycoon as a traitor. He startled even the new government by urging the removal of the capital from Kioto to Yedo, the abandonment of the habits of excessive reverence to the sovereign, and his entrance into public life as the active ruler of his people. Such was the lively effect of Okubo's memorial, that within one month the mikado publicly took the oath on which the government of New Japan is built. The national capital was changed to Yedo, now called Tokio. Okubo thenceforward represented in his own person the foreign influences which have shaped the course of Japan since 1868. His name is imperishably associated with the long list of reforms which have changed the insular empire from an agglomeration of feudal principalities to a compact modern state. Of all Japanese statesmen he was the least distinctly Japanese. A stong dash of the Caucasian in his character eminently fitted him to be the interpreter of foreign ideas to the mikado's court. In personal appearance his tall, arrowy form and luxuriant side whiskers gave him the appearance of a European rather than an Asiatic. He visited America with the embassy in 1872, and on his return was made minister of the interior. When the Saga rebellion broke out in 1873 he went in person on the battle-fields, and sat at the tribunals that condemned the insurgents to death. When the Japanese army landed in Formosa in 1874 to chastise the cannibals, and the Chinese demanded their withdrawal, Okubo was sent by the mikado to Pekin to present the ultimatum of Japan. The Chinese paid the indemnity demanded of 700,000 taels, and agreed to police the coasts of aboriginal Formosa. He was president of the Japanese commission to the centennial exposition at Philadelphia, but did not visit America. On the night of May 13, 1878, having been warned of his impending assassination (by fanatics who hated his progressive policy) he expressed before a party of friends his belief in the decree of heaven that would protect him if his work were not yet done; but which, otherwise, would permit his death, even though he were surrounded by soldiers. On May 14, while on his way to the mikado's palace unarmed, he was murdered by six assassins, who were said to have been runaways from the Satsuma rebellion, put down only a few months before. The mikado immediately conferred upon his dead servant the highest rank, and elevated his sons to the nobility. In the funeral cortege, probably the most imposing ever seen in Tokio, rode the highest nobles, officials, and foreign diplomats. Okubo was unquestionably one of the ablest men Japan ever produced.

OKUMA SHIGE'NOBU, a Japanese statesmen b. in the province of Hizen in 1837. He was among the number of progressive young men who early studied the Dutch language and sciences, going to Nagasaki for that purpose; whence he was called to Tokio, to a post in the foreign office. He was transferred to the finance department in 1869. There his conspicuous abilities brought him to the notice of the mikado, who created him a Sangi or imperial counselor. In 1871 he was made president of the commissioners to the Vienna exposition. The ability displayed by Mr. Okuma Shigenobu in handling the finances of an Asiatic nation while in a transitional condition from mediæval feudalism to modern forms of government, and through all the perplexities incident to not less than four great insurrections, have been acknowledged by many competent foreign observers. Under his administration the hereditary incomes of the samusai or gentry have been capitalized; an internal revenue and national banking system, based on those of the United States, have been established; the local paper money issues of the daimios replaced by national currency; loans raised, and the national credit maintained in Europe and at home. He is still, in 1880, a leading member of the Japanese cabinet.

OLAF, the saint, one of the most revered of the early Norwegian kings, was born in 995; and after having distinguished himself by his gallant exploits, and made his name a terror in several warlike expeditions on the coasts of Normandy and England, succeeded, in 1015, in wresting the throne of Norway from Eric and Svend Jarl. The cruel severity with which he endeavored to exterminate paganism by fire and sworld, alienated the affection of his subjects, many of whom sought security from his persecution in the territories of Knut or Canute the great, king of Denmark; and it was only through the powerful aid of his brother-in-law, the Swedish Anund Jacob, that his authority could be upheld. Olaf's hot-headed zeal, however, after a time exhausted the patience of the people, who hastened to tender their allegiance to Knut, on his landing in Norway in 1028, when Olaf fled to the court of his brother-in-law, Jaroslav of Russia, who gave him a band of 4,000 men, at the head of whom he returned in 1030, and gave Knut battle at Stiklestad, where Olaf was defeated by the aid of his own subjects, and slain. The body of the king, which had been left on the field of battle, and buried on the spot by a peasant, having begun to work miracles, his remains were carefully removed to the cathedral of Trondhjem, where the fame of their miraculous power spread far and wide, attracting pilgrims from all parts of the Scandinavian peninsula. Olaf was solemnly proclaimed patron saint of Norway in the succeeding century; and from that period till the reformation he continued to gather round him a rich heritage of mythical legends and popular sagas, the memory of which still lingers in the folk-lore of Norway. In 1847 the order of Olaf was created, in honor of the saint, by king Oscar I. of Sweden and Norway.

ÖLAND. See ŒLAND, *ante.*

OLBERS, HEINRICH WILHELM MATHIAS, a celebrated German physician and astronomer, was born at Arbergen, a small village of Bremen, Oct. 11, 1758. He studied medicine at Göttingen from 1777 till 1780, and subsequently commenced to practice at Bremen, where, both as a physician and as a man, he was highly esteemed by his fellow-citizens. In 1811 he was a successful competitor for the prize proposed by Napoleon for the best "Memoir on the Croup." Olbers wrote little on medical subjects, for, from 1779, all the leisure time which he could abstract from professional occupations was devoted to the enthusiastic study of astronomy. The first thing which brought him into notice was his calculation of the orbit of the comet of 1779, which was performed by him while watching by the bedside of a sick patient, and was found to be very accurate. Comets were the chief objects of his investigation, and he seems to have been seized with an irresistible predilection for these vagabonds of the solar system, which his two important discoveries of the planets Pallas (1802) and Vesta (1807) could not diminish. In 1781 he had the honor of first re-discovering the planet Uranus, which had previously been supposed, even by Herschel himself, to be a comet, and which had been sought for in vain. He also discovered five comets, in 1798, 1802, 1804, 1815, and 1821, all of which, with the exception of that of 1815 (hence called *Olbers's comet*), had been some days previously observed at Paris. His observations, calculations, and notices of various comets, which are of inestimable value to astronomers, were published in the *Annuaire of Bode* (1782-1829), in the *Annuaire of Encke* (1832), and in three collections by the baron de Zach. Most of these calculations were made after a new method, discovered by himself, for determining the orbit of a comet from three observations; a method which, for facility and accuracy, he considered as greatly preferable to those then in use. A detail of it appeared in a journal published at Weimar (1797), and a new edition by Encke in 1847. Olbers was one of that small band of astronomers which included also Schröter, Gauss Piazzi, Bode, Harding, etc., who in the first ten years of the 19th c. devoted their energies to the observation of those planets which were coming to light between Mars and Jupiter. As above stated, two of them, the second and fourth in order of discovery, were detected by Olbers himself; and the general equality of the elements of the four planetoids led him to propound the well-known theory, that these, and the other planetoids (q.v.) since discovered, are but fragments of some large planet which formerly revolved round the sun at a distance equal to the mean of the distances of the planetoids from the same luminary. It was this theory which led him, after the discovery of Pallas, to seek for more fragments of the supposed planet, a search resulting in the discovery of Vesta. Olbers also made some important researches on the probable lunar origin of meteoric stones, and invented a method for calculating the velocity of falling stars. Olbers died at Bremen, Mar. 2, 1840; and in 1850 his fellow-citizens erected a marble statue in honor of him. Olbers, as a writer, possessed great powers of thought, combined with equal clearness and elegance of expression. The dissertations with which he enriched the various branches of astronomy are scattered through various collections, journals, and other periodicals.

OLDBURY, an important manufacturing t. of England, in the county of Worcester, 29 m. n.n.e. of the city of that name, on the river Teme. It contains numerous churches, meeting-houses, and schools. Owing to the extension of the iron trade, Oldbury has greatly increased in size and prosperity within recent years. There are coal and iron mines in the neighborhood; and in the town iron, steel, locomotive engines, mills, edge tools, draining-pipes, etc., are made and constructed. The Stour Valley railway passes close by the town, and there is a station here. Pop. '71, 16,410.

OLDCASTLE, Sir JOHN, once popularly known as the "good lord Cobham," whose claim to distinction is that he was the first author and the first martyr among the English nobility, was born in the reign of Edward III.; the exact year is not known. He acquired the title of lord Cobham by marriage, and signalized himself by the ardor of his attachment to the doctrines of Wycliffe. At that time there was a party among the English nobles and gentry sincerely, and even strongly desirous of ecclesiastical reform—the leader of which was "old John of Gaunt—time-honored Lancaster." Oldcastle was active in the same cause, and took part in the presentation of a remonstrance to the English commons on the subject of the corruptions of the church. At his own expense he got the works of Wycliffe transcribed, and widely disseminated among the people, and paid a large body of preachers to propagate the views of the reformer throughout the country. During the reign of Henry IV. he commanded an English army in France, and forced the duke of Orleans to raise the siege of Paris; but in the reign of Henry V. he was accused of heresy, and having, in a disputation with his sovereign, declared that "as sure as God's word is true, the pope is the great Antichrist foretold in Holy Writ," he was thrown into the Tower, whence, after some time, he escaped, and concealed himself in Wales. A bill of attainder was passed against him, and 1000 marks set upon his head. After four years' hiding he was captured, brought to London, and—being reckoned a traitor as well as a heretic—he was hung up in chains alive upon a gallows, and fire being put under him, was burned to death, Dec., 1417. Oldcastle wrote *Twelve Conclusions addressed to the Parliament of England*, several monkish rhymes against "fleshlye livers" among the clergy, religious discourses, etc.—See *Life of Oldcastle*, by Gilpin.

OLD CATHOLICS, those members of the Roman Catholic church in Germany who, in 1870, took the ground that the dogma of the immaculate conception of 1854, the encyclical and syllabus of 1864, and the decree of papal infallibility had so changed the status of the Roman church that no man could continue in its communion and still adhere to the Catholic church of Christ. They disputed the œcumenical character of the Vatican council, and, although the promoters of the movement included *before* the promulgation of the decree the German and Austrian bishops who had entered a united protest against it, the bishops withdrew and submitted *after* its proclamation, July 8, 1870. A large number of German theologians and civilians, however, denounced the course of the bishops, and prof. Michælis openly charged the pope with heresy and apostasy. This was followed by a formal declaration and protest by Dr. Döllinger and 43 other professors of the university of Munich against papal infallibility and the validity of the Vatican decrees. A conference was held at Nuremberg, Aug., 1870, which, though purely consultative, drew up a united protest against the œcumenical character of the vatican council, and the binding authority of its acts. Prominent among the signers appeared the weighty names of Döllinger, Friedrich, Schulte, Michælis, and Lutterbeck.

This formal protest induced the bishops forthwith to initiate repressive measures. In a pastoral, Sept. 10, they sounded the alarm and warned all true Catholics to submit; and when it became evident that the movement had not become popular with the clergy and laity, they went further in depriving the protesting theologians of their functions, excommunicated them, and forbade students to frequent their lectures. With the exception of a few lukewarm, timid adherents, the great body of the reformers remained firm in their convictions. Döllinger, in a letter to his diocesan, dated Mar. 28, 1871, declared that, "as a Christian, as a theologian, as an historian, and as a citizen," he could not accept the new dogma. He was excommunicated for it April 17, 1871. His excommunication became the starting point of revived energy throughout Germany. In a formal declaration of principles the promoters of the movement said: "Faithful to the inviolable duty of every catholic Christian, which is also a thing not denied by pope or bishop, to hold fast by the ancient faith, and to reject innovations, even if proclaimed by an angel from heaven, we persist in the rejection of the Vatican dogma." The first old Catholic congress met at Munich, Sept. 22, 1871. It was attended by about 300 delegates from Germany, Austria, and Switzerland, and friends from Holland, France, Russia, England, and elsewhere. In the resolutions adopted the body defined its theological status, and said with regard to its relations to other members of the Catholic church: "We declare that the reproach of Jansenism against the Utrecht church is causeless; there is no dogmatic difference between her and ourselves. We hope for reunion with the oriental Greek and with the Russian churches, whose separation was without absolute cause, and is based on no irreconcilable dogmatic difference. We expect, in the assumption of the reforms which we attempt, and in the way of science, and of progressing Christian knowledge, a gradual understanding with the Protestant and Episcopal churches." The disposition of Döllinger to stave off a complete ecclesiastical organization had to yield to the predominant opposite feeling. Meanwhile the old Catholic congregations were without episcopal supervision and ministrations, and the Bavarian congregations secured the friendly offices of the archbishop of Utrecht in the administration of confirmation. When the second old Catholic congress met at Cologne, Sept., 1872, the work of organization made progress. The church was to depend for episcopal functions temporarily on the bishops of the old Catholic church of Holland, and of the United Armenian church, whose attitude to Rome was analogous with their own. A commission was appointed to take order for the election of a bishop by the clergy and laity. Intercommunion with the Eastern and Anglican churches was sought to be established. The claim to recognition by the state, with a share of the church property, was asserted. In the following year (June 4, 1873) Dr. Joseph Hubert Reinkens, professor of theology in the university of Breslau, was elected missionary bishop for Germany, and consecrated Aug. 11, at Rotterdam, by the bishop of Deventer. The third Old Catholic congress was held Sept. 12–14 at Constance, whose crowning act was the adoption of a synodal constitution, which provides for diocesan, provincial, and general synods, composed of clerical and lay delegates, the latter on the basis of one delegate for every 200 constituents. The first synod, at Bonn, May 27, 1874, was attended by 28 clerical and 60 lay delegates. In the direction of reform its action was marked by conservative caution; confession, fasting and abstinence, and priestly celibacy were retained, the prevailing sentiment being the correction of Roman abuses and corruptions to the purer practice of the early church. The obnoxious features of so-called mixed marriages, i.e., marriages between Roman Catholics and Protestants, were set aside; the drafting of a new ritual and catechism was assigned to committees; a synodal representation or standing committee was appointed. The church at that time reported the existence throughout Germany of 182 parishes and societies, numbering about 25,000 souls, 41 priests, and 12 theological students. The 4th congress, at Freiburg, in Baden, Sept. 5—9, 1874, took action to establish an equitable legal status of the Old Catholic church in Germany, and a *pro rata* share of the church property. The congress was followed by a conference aiming at church unity, at Bonn, Sept. 14–16, 1874, at which Dr. Döllinger presided, and in which, besides old Catholics, Easterns and Anglicans participated. It was unanimously agreed that the insertion of the words *filioque* in the Nicene creed was unlawful, and that it was very desirable to have them expunged by the concurrent action of the different churches. Other points of agreement amongst Old Catholics, Anglicans, and orientals were also discussed; e.g., the place of the Apocrypha in the canon; the relation of versions of the Bible to the original text; the proper language (a dead one or the vernacular) for the conduct of divine service; the doctrines of supererogation and indulgences, and of the immaculate conception. The prevailing sentiment on these and kindred themes was decidedly anti-papal, and agreement on them was regarded as a possible basis for the unification of Christendom.

The 5th Old Catholic congress was at Breslau, Silesia, Sept. 22-24, 1876, thinly attended, in part on account of the great distance of that city from the centers of the Old Catholic movement, and in part also on account of waning interest. The latter circumstance holds good also concerning the 6th congress, held Sept., 1878, at Mayence, of which no official report has been published. There is doubtless great disappointment in the comparatively slow progress of the movement, which has failed to enlist popular enthusiasm, but the tide seems to have set in the direction of greater growth and revived energy, as will be seen from a subsequent paragraph.

The national church of Holland, generally but erroneously styled Jansenist, has heartily entered into the Old Catholic movement, and may be regarded as occupying identical ground.

The relation of the Old Catholic church of Germany to the Anglican communion is very friendly. Representatives of the church of England and the Protestant Episcopal church in the United States have been present at most of their congresses, and several of their synods; and the Anglican communion may be said to be in cordial sympathy with the Old Catholics. The presence of bishop Herzog at the general convention (Prot. Epis.) held at New York, Oct., 1880, has tended to strengthen that feeling (see below).

In Switzerland the old Catholic reform had a more pronounced effect on the people than in Germany. At Geneva it carried with it the majority of the Roman Catholics of the city. The cantonal government, moreover, aided it by speedy recognition. An old Catholic conference, held at Olten, Aug. 31, 1873, resolved upon drafting a constitution for a Swiss national church, and electing a bishop or bishops. At a like conference at the same place, Sept. 21, 1874, a constitution was adopted which provides for a national synod of "the Christian Catholic church of Switzerland," by which the Swiss Old Catholics are now known. Pastor Herzog of Olten was subsequently chosen and consecrated bishop. The statistics of the church, presented to the synod in 1877, were: 66 parishes and 70 priests; baptisms for the year, 1182; number of persons confirmed, 8,098.

In Austria the Old Catholic movement has been very slow. There are several congregations in Bohemia, and under the influence of recent political changes the first lawfully authorized Old Catholic synod of Austria was held at Vienna, June 29, 1880, which adopted synodal and parochial regulations, and decreed the use of the language of the people in divine service.

In Russia, in the province of Volhynia, are also several Bohemian communities attached to the Old Catholic church, served by three priests, recognized and supported by the state, who were, in Dec., 1879, taking steps looking towards the formation of a synodal council.

At the Swiss Christian Catholic synod, at Geneva, May 20, 1880, bishop Herzog reported that owing to peculiar state complications the church had lost in the canton of Bern 12 parishes and 10 priests; but that they numbered throughout Switzerland 59 priests in 48 established parishes. At this synod a prayer-book, framed after an Anglican model, was authoritatively set forth for present use. The executive council of Switzerland has issued a decree defining the right of possession of churches, to wit, that the majority in a parish, be they Roman or Old Catholic, are invested with the ownership, but that the minority are also entitled to worship in them without paying an indemnity.

The 7th Old Catholic congress, at Baden-Baden, Sept. 12-14, 1880, was attended by 150 delegates, at which bishop Reinkens reported favorably of progress in Germany, in which now are somewhat less than 50,000 adherents. The congress resolved unanimously upon the universal use of the German liturgy in public worship, and adopted a number of theses, which accurately describe the present attitude of the Old Catholics towards the Latin church.

1. It is impossible that there should be a real contradiction between belief, based on historical testimony, of the fundamental truths of Christianity, and science, based on the absolute facts of nature and mind. They mutually protect, aid, and complete each other. 2. The independence of national churches accords as much with the universal character of the church as national peculiarities in the state, in art, and in science accord with the general objects of culture. 3. It is an unfortunate error of many Protestants to regard that church, which the adherents of the vatican are bound to acknowledge as alone saving, as a shield of faith, a prop of authority to the state or society, and a bulwark against destructive social tendencies; and to receive its adherents as conservative allies. 4. History, the task and duty of self-preservation compel the German empire to oppose the vatican system. 5. Negotiations with the infallible pope, or his organs, on all matters belonging to the legislative functions and the authority of the state should be repudiated. All such transactions conduce to the dissolution of the national state.

Ground, somewhat similar to that occupied by the Old Catholics, is held by the *Armenian* church, which, since 1867, felt greatly aggrieved by the course of the pope, who, in his bull *Reversurus*, changed the manner of choosing their patriarchs and bishops. The third vatican decree, declaring the pope's universal episcopate, was especially distasteful to them. In Oct., 1870, they declared that while they had not fully decided as to the vatican council, whose decrees many had refused to accept, who yet remained Catholics, they would not receive any decree which set aside that of Florence. In Nov., 1871, the pope excommunicated those of them who would not yield. They deposed their patriarch, and elected in his place Kiepeliau, archbishop of Diarbekir. They have since been put in possession, by the Turkish government, of many of the united Armenian churches.

In France, M. Hyacinthe-Loyson may be regarded as generally representing Old Catholic views. His aim is the reformation of the Roman Catholic church in that country on the basis and principles of the old Gallican church.

OLDENBURG, a grand-duchy of northern Germany, consisting of three distinct and widely separated territories, viz., Oldenburg proper, the principality of Lübeck, and the principality of Birkenfeld. The collective area of these districts is now 2,461 square miles. Pop. in 1875, 319,314. Oldenburg proper, which comprises seven-eighths of this area, and four-fifths of the entire population, is bounded on the n. by the German ocean, e., s., and w. by the kingdom of Hanover. The principal rivers of Oldenburg are the Weser, the Jahde, and the Haase, Vehne, and other tributaries of the Ems. The grand-duchy of Oldenburg proper is divided into 8 circles. The country is flat, belonging to the great sandy plain of northern Germany, and consists for the most part of moors, heaths, marsh or fens, and uncultivated sandy tracts; but here and there, on the banks of the rivers, the uniform level is broken by gentle acclivities, covered with wood, or by picturesque lakes surrounded by fruitful pasture-lands. Agriculture and the rearing of cattle constitute the chief sources of wealth. The horses and cattle raised in the marsh lands are excellent of their kind, and in great request; the horse-markets at Oldenburg, and the cattle sales at Ovelgönne, being frequented by purchasers from every part of Germany. The scarcity of wood for fuel, and the absence of coal, are compensated for by the existence of turf-beds of enormous extent. With the exception of some linen and stocking looms, and a few tobacco works, there are no manufactories. There are, however, numerous distilleries, breweries, and tan-yards in all parts of the duchy.

The trade is principally a coasting trade. carried on in small vessels, from 20 to 40 tons, which can thread their way along the shallow channels connecting the larger rivers.

The exports are horses, cattle, linens, thread, hides, and rags, which find their way chiefly to Holland and the Hanseatic cities; while the imports include the ordinary colonial goods, and manufactures of numerous kinds.

The receipts for the collective grand-duchy were, in the budget for 1875, 7,104,150 marks, and the expenditure, 7,546,880. The public debt, at the close of 1874, was 84,575,942 marks.

The principality of Lübeck, consisting of the secularized territories of the former bishopric of the same name, is surrounded by the duchy of Holstein, and is situated on the banks of the rivers Schwartau and Trave. It contributes 199 sq.m. to the general area of the grand-duchy, and 34,085 inhabitants to the collective population. It is divided into four administrative districts. It has several large lakes, as those of Plön—noted for its picturesque beauty—Keller, Uklei, and Gross-Eutin; while in regard to climate, soil, and natural products, it participates in the general physical characteristics of Holstein. The chief town is Eutin (pop. in 1871, 3,700), pleasantly situated on the lake of the same name, with a fine castle surrounded by a magnificent park.

The principality of Birkenfeld, lying s.w. of the Rhine, among the Hundsrück mountains, and between Rhenish Prussia and Lichtenberg, is an outlying territory, situated in lat. 49° 30′—49° 52′ n., and in long. 7°—7° 30′ e. Its area is 192 sq.m., and its pop. 37,093. The soil of Birkenfeld is not generally productive; but in the lower and more sheltered valleys, it yields wheat, flax, and hemp. Wood is abundant. The mineral products, which are of considerable importance, comprise iron, copper, lead, coal, and building-stone; while in addition to the rearing of cattle, sheep and swine, the polishing of stones, more especially agates, constitutes the principal source of industry. The principality is divided into three governmental districts.

Oldenburg is a constitutional ducal monarchy, hereditary in the male line of the reigning family. The constitution, which is based upon that of 1849, revised in 1852, is common to the three provinces, which are represented in one joint chamber, composed of 33 members, chosen by free voters. Each principality has, however, its special provincial council, the members of which are likewise elected by votes; while each governmental district within the provinces has its local board of councilors, and its several courts of law, police, finance, etc.; although the highest judicial court of appeal, and the ecclesiastical and ministerial offices, are located at Oldenburg.

Perfect liberty of conscience was guaranteed by the constitution of 1849. The Lutheran is the predominant church, upwards of 200,000 of the population belonging to that denomination; while about 70,000 persons profess the Roman Catholic religion.

There are two gymnasia, one higher provincial college, several secondary, and 500 elementary schools; but in consequence of the scarcity of villages in the duchy, and the isolated position of many of the houses of the peasantry, schools are not common in the country districts, and the standard of education of the lower classes is, from these causes, scarcely equal to that existing in other parts of northern Germany. The military forces of Oldenburg—above 2,000 men on the peace footing—form a portion of the Prussian army. The merchant navy in 1875 consisted of 361 vessels of 58,167 tons. Oldenburg is represented in the bundesrath or federal council of the German empire by one member, and in the reichstag or diet by 3 members.

History.—The territory now included in the grand-duchy of Oldenburg, was in ancient times occupied by the Teutonic race of the Chauci, who were subsequently merged with the more generally known Frisii, or Frisians; and the land, under the names of Ammergau and Lerigau, was for a long period included among the dominions of the dukes of Saxony. In 1180, the counts of Oldenburg and Delmenhorst succeeded in establishing independent states from the territories of Henry the Lion, which fell into a condition of disorganization after his downfall.

This family has continued to rule Oldenburg to the present day, giving, moreover, new dynasties to the kingdom of Denmark, the empire of Russia, and the kingdom of Sweden. See OLDENBURG, HOUSE OF. On the death, in 1667, of count Anthony Gunther, the wisest and best of the Oldenburg rulers, his dominions, in default of nearer heirs, fell to the Danish reigning family, and continued for a century to be ruled by viceroys nominated by the kings of Denmark. This union was, however, severed in 1773, when, by a family compact, Christian VII. made over his Oldenburg territories to the grand-duke Paul of Russia, who represented the Holstein-Gottorp branch of the family. Paul having renounced the joint countships of Delmenhorst and Oldenburg in favor of his cousin, Frederick Augustus, of the younger or Kiel line, of the House of Oldenburg, who was prince-bishop of Lübeck, the emperor raised the united Oldenburg territories to the rank of a duchy. The present reigning family is descended from duke Peter Friedrick Ludwig, cousin to the prince-bishop, Frederick Augustus. For a time the duke was a member of Napoleon's Rhenish confederation; but French troops having, in spite of this bond of alliance, taken forcible possession of the duchy in 1811, and incorporated it with the French empire, the ejected prince joined the ranks of the allies. In recognition of this adhesion, the congress of Vienna transferred certain portions of territory, with 5,000 Hanoverians and 20,000 inhabitants of the quondam French district of the Saar, to the Oldenburg allegiance. From these new acquisitions were organized the district Amme, and the principality of Birkenfeld; while Oldenburg was raised to the dignity of a grand-duchy. The revolutionary movement of 1848 was quite as productive of violent and compulsory political changes in this as in other German states; and in 1849, after having existed for centuries without even a show of constitutional or legislative freedom, it entered suddenly into possession of the most extreme of liberal constitutions. The reaction in favor of absolutism, which the license and want of purpose of the popular party naturally induced all over Germany, led in 1852 to a revision and modification of the constitution, which, however, in its present form, contains the essential principals of popular liberty and security, though it must be confessed this is more verbal than real. In the German-Italian war, Oldenburg sided with Prussia, and afterward joined the North German confederation. The duchy concluded, in 1866, a treaty with Prussia, by which the grand-duke renounced his claims to the Holstein succession, for the cession to him of a small portion of Holstein territory, and an indemnity of 1,000,000 thalers. Oldenburg is now included in the German empire.

OLDENBURG, capital of the grand-duchy of the same name, is pleasantly situated on the banks of the navigable river Hunte, 25 m. w.n.w. of Bremen. Pop. '75, 15,701. Oldenburg is the seat of the administrative departments, and the focus of the literary, scientific, and commercial activity of the duchy. It has a normal school, a military academy, a public library of 85,000 vols., a picture-gallery, museum, etc. The grand-ducal palace is worthy of note for its fine gardens, its valuable pictures, and other art collections, and its library. The principal church is St. Lambert's, containing the burying vaults of the reigning family. Oldenburg is the seat of an active river trade, and is noted for its excellent studs, and the great cattle and horse fairs which are annually held here in the months of June and August.

OLDENBURG, HOUSE OF, which lays just claim to being one of the oldest reigning families of Europe, has been rendered still more illustrious by various matrimonial alliances, which, in the course of ages, have successively been the means of creating new royal dynasties. Thus, for instance, in 1448, a scion of this house being elected king of Denmark, under the title of Christian I., became the progenitor of the Danish house of Oldenburg, the imperial house of Russia, the late royal family of Sweden, and the collateral and junior Danish lines of Augustenburg, Kiel, and Sonderburg-Glücksburg. Christian owed his election to the recommendation of his maternal uncle, duke Adolph of Schleswig, who, when the throne was offered to him on the sudden death of king Christopher, refused, on the ground of age, and proposed Christian of Oldenburg, who, as the direct descendant of Eric Glipping's daughter, princess Richissa, was allied to the old extinct house of Denmark. The death, in 1459, of Adolph, duke of Schleswig and count of Holstein, without male heirs, opened the question of succession to those states, which has since become one of such vexatious import. The ancient law of Denmark recognized hereditary fiefs only in exceptional cases; crowned fiefs being generally held for life or merely for a time *ad gratiam*. Such being the case, Schleswig might, on the death of Adolph, have been taken by the crown as a lapsed tenure; but Holstein, being held under the empire, would have been separated from it. Adolph and his subjects were alike anxious that Schleswig and Holstein should continue united; but although the Schleswig estates, at the wish of the duke Adolph, had recognized Christian as successor to the duchy before his accession to the throne of Denmark, the Holstein chambers were divided on the question of succession, the majority showing a preference for the claims of the counts of Schauenburg, who were descended from *male* agnates of the Holstein house. Christian in his eagerness to secure both states, was willing to sacrifice his rights in Schleswig to his schemes in regard to Holstein; and having bought over the Holstein nobles by bribes and fair promises, he was elected duke of Schleswig and count of Holstein at Ribe in 1460, where he signed a deed, alike derogatory to the interests and unworthy the dignity of his crown. In this compact, by which he bartered away the just prerogatives and independence of himself and his successors, for the sake of nominal present gain, he pledged his word for himself and his heirs, that the two provinces should always remain undivided, "*ewig bliben toosamende ungedeelt*," and not be dismembered by division or heritage. This document, which remained for ages unknown or forgotten, was discovered by the historian Dahlmann amid the neglected papers of the Holstein state archives at Preetz, and proclaimed in 1848 by that ardent admirer of Germany as the unchangeable fundamental law of the Schleswig-Holstein provinces. The confusion, dissension, and ill-will to which this fatal deed has given rise, are the fruits which Christian's unscrupulous desire to secure power at any cost has produced for his descendants, whose complicated claims on the duchies, resulted, in 1864, in a war which cost Denmark a large portion of her territorial possession. From Christian I. descend two distinct banches of the Oldenburg line: 1. The royal dynasty, extinct in the male line in Frederick VII., late king of Denmark, and the collateral branches of Sonderburg-Augustenburg and Sonderburg-Glücksburg; 2. The ducal Holstein-Gottorp line, descended from duke Adolph, who died in 1586, and was the second son of king Frederick I. This prince had received, during his father's life-time, a portion of the Schleswig and Holstein lands, which he was permitted, on the accession of his elder brother, Christian III., to retain for himself and his heirs. This line became illustrious by the marriage of prince Karl Friedrich, the son of Hedwig-Sofia, eldest sister of Charles XII. of Sweden (a direct descendant of duke Adolph) with the grand-duchess Anna, daughter of Peter the great, and thus gave to Russia the dynasty which still occupies the imperial throne; while Adolph-Friedrich, a cousin prince Karl Friedrich, by his election to the throne of Sweden in 1751, added another crown to those already held by the house of Oldenburg. The conduct of his descendants rendered the new dignity short-lived, for with the abdication of Gustavus IV., in 1809, the Holstein-Gottorp dynasty became extinct in Sweden.

The complicated relations of the house of Oldenburg in regard to the Danish succession, after giving rise to much angry discussion among the princes interested in the question, and the Danish people themselves, led the great powers to enter into a treaty, known as the London treaty of 1852, for settling the question of succession, on the ground that the integrity of the Danish monarchy was intimately connected with the maintenance of the balance of power and the cause of peace in Europe. England, France, Austria, Prussia, Russia, Sweden, and Denmark, were parties to this treaty, in the first article of which it was provided, that on the extinction of the male line of the royal house, prince Christian of Schleswig-Holstein-Sonderburg-Glücksburg, and his male heirs, according to the order of primogeniture, should succeed to all the dominions, then united under the sway of the king of Denmark. The rights of succession, which rested with the Augustenburg family, were forfeited by a compact with the duke of Augustenburg, entered into for the surrender of his claims, in consideration of a sum of money paid to him by Denmark. The duke's morganatic marriage, and his subsequent rebellion, in 1848, against the Danish king, were the causes which led to the arrangement of this family compact on the existing terms. This treaty, known as the London protocol of May, 1852, was followed in October of the same year by the publication of a supplemtary clause, which stipulated, that on the extinction of the heirs-male of prince Christian of Schleswig-Holstein-Sonderburg-Glücksburg, the Holstein-Gottorp, or imperial Russian line should succeed to the Danish dominions. This article, even more than the original clauses of the treaty, met with the strongest opposition among the Danes, and after being twice rejected in the Landsthing, the London treaty was only ratified after a new election of members, and on the assurance of the king that in excluding all female cognate lines from the succession, there was no definite intention of advancing the claims of Russia. King Frederick's death, in 1863, brought on the crisis of the much-vexed question of the Danish succession; and although the London treaty was so far followed that prince Christian succeeded as king of Denmark, the evils that were anticipated from the measure were in 1864 made painfully manifest; for the duke of Augustenburg, notwithstanding the renunciation by his family of all claims to the succession, appealed to the federal diet for the recognition of his rights on Holstein; and the German powers, glad of a pretext to extend their influence beyond the Eider, occupied the Schleswig-Holstein (q.v.) territory, and succeeded, by force of superior numbers, in advancing the boundary of Germany to the borders of Jutland. This led, however, to grave results affecting the whole of Europe. Prussia and Austria took possession of the conquests in their own names. The former power offered the latter pecuniary compensation for their assistance in the war, while indicating a determination to annex the duchies to its own dominions. Austria refused, and this led to the disastrous battle of Königgratz.

OLDHAM, a co. in n.w. Kentucky, bordering on Indiana, from which it is separated by the Ohio river, intersected by the Louisiana, Cincinnati and Lexington railroad; 200 sq.m.; pop. '80, 7,685—7,476 of American birth; 2,222 colored. The surface is hilly but fertile. Wheat, cotton, Indian corn, oats, and pork are the chief products. Limestone is found. Co. seat, La Grange.

OLDHAM, a parliamentary borough and flourishing manufacturing t. of England, in the co. of Lancashire, stands on the Medlock, 6 m. n.e. of Manchester. It owes its rapid increase in population and in wealth to the extensive coal-mines in the vicinity, and to its cotton manufactures, which have increased remarkably within late years. It is not only the great center of the hat-manufacture, but is also celebrated for its manufactures of fustians, velveteens, cords, cotton, woolen, and silk goods. Numerous silk-mills, brass and iron foundries, machine-shops, tanneries, rope-works, etc., are in operation. The parish church, the town-hall, the blue-coat, and the grammar-schools, are the chief edifices. Pop. in 1871 of municipal borough, 82,629; of parliamentary borough (which returns two members to parliament), 118,100.

OLDHAM, John; about 1590–1636; b. England; emigrated to Plymouth in 1623, and in association with Lyford endeavored to establish a separate worship on the Sabbath. He was also credited with the intention of changing the form of government at Plymouth. In 1633, he went from Dorchester to what is now Windsor, Conn., and his exploration resulted in the settlement of that town. He represented Watertown in the general court of 1634, and was killed in 1636 by Indians who came aboard his ship to trade. His murder brought on the Pequot war.

OLDHAM, John, 1653–83; b. England; educated at Oxford, where he won distinction by his proficiency in Latin and Greek, and by his English poetry. Want of means forced him to leave the university in 1674, and he soon secured employment as an usher at the free school in Croydon Surrey. The first of his published poems was a Pindaric ode, on the death of his friend, Richard Morwent; it is rich in comparisons, and shows a tenderness in strong contrast with the fierce satire of his later works. He continued to cultivate poetry as a relief from the drudgery of "beating Greek and Latin for his life," as he describes it; and some of his MS. poems attracted the notice of the reigning London wits, sir Charles Sedley, the earl of Dorset, and the earl of Rochester, who paid him a visit at Croydon. By their influence he was made tutor to the sons of sir Edward Thurlow, with whom he lived till 1680. At this time he was engaged upon his *Satires upon the Jesuits*, which appeared in 1679, when the excitement in regard to the so-called "Popish plot" was at its height. They are full of bitterness and Protestant rancor, and gained for Oldham a high reputation. While tutor to the son of sir William Hicks, he became acquainted with Dr. Richard Lower, a famous London physician, and was induced to study medicine; but he abandoned it at the end of a year and, settling in London, devoted himself to literature. He was an intimate friend of Dryden and the other wits and satirists of the day. He refused the post of private chaplain to the earl of Kingston, who was his patron, and had proposed to have him enter holy orders. His last poem is called *A Sunday Thought in Sickness*, and is of a devotional character. His poems are forcible and vehement, but defective in versification. Oldham, in the opinion of Hallam, "ranks next to Dryden; he is spirited and pointed, but his versification is too negligent, and his subjects temporary."

OLDHA'MIA, a genus of fossil zoophytes, dedicated by Forbes to prof. Oldham, who was their discoverer. Only two species are known, but they are of peculiar interest, because, with their associated worm-tracts and burrows, they are the first distinct evidence of life on the globe. They exist as mere tracings on the surface of the laminæ of metamorphosed shales, all remains of the substance of the organism having entirely disappeared. The form of the hard polypidom is preserved, and shows a jointed main stem, giving off at each joint, in the one species, a circle of simple rays, and in the other a fan-shaped group. Forbes pointed out their affinities in some respects to the hydrozoa, and in others to the polyzoa. Kinahan, who described the genus at some length, considers them to have been hydrozoa allied to sertularia; while Huxley places them among the polyzoa.

OLD MAN OF THE MOUNTAIN. See ASSASSINS, *ante*.

OLDMIX'ON, JOHN, 1673-1742; b. England. He superintended and revised the first edition of bishop Kennett's collection of English historians. In 1708 he published *The British Empire in America*, 2 vols., later edition in 1741. In 1715-16 *Memoirs of North Britain* and *Memoirs of Ireland;* in 1727, *Clarendon and Whitlock Compared;* and in 1730, '35, '39, 3 vols., containing histories of the reigns of Henry VIII., Edward VI., Mary and Elizabeth, also of the Stuarts, William and Mary, Anne, and George I. In 1742 he published *Memoirs of the Press, Historical and Political, for Thirty Years.* He was a strong partisan, and was called a whig historian, defending whig principles even in his historical works. He was a severe and unscrupulous critic of Pope, Swift, Grey, and other celebrities of the time, in his contributions to the magazines, and his *Prose essay on Criticism*, which Pope notices in his *Dunciad.* As a reward for his services to the whig party, he was appointed collector of customs at the port of Bridgewater. He is said to have visited America.

OLD POINT COMFORT, a village and watering-place in Virginia, at the entrance of Hampton roads, and James river, 12 m. from Norfolk, and the site of fortress Monroe, the largest military work in the United States.

OLD RED SANDSTONE, the name given to a large series palæozoic rocks, of which red sandstones are the most conspicuous portions, but which contains also white, yellow, or green sandstones, as well as beds of clay and limestone. The group lies below the carboniferous strata, and was called "Old" to distinguish it from a newer series of similar beds which occur above the coal measures. The discovery that the highly fossiliferous calcareous rocks of Devonshire and the continent occupied the same geological horizon, showed that the name was very far from being descriptive of all the deposits of the period, and suggested to Murchison and Sedgewick the desirableness of giving them a new designation. They consequently proposed Devonian, which has been extensively adopted; but it is liable to the same objection as that urged against the name it was intended to supplant, inasmuch as it incorrectly limits geographically what the other limits lithologically. Many names used by geologists are similarly at fault; there is therefore no good reason why the old name should be given up, especially as it has been rendered classical by the labors and writings of Hugh Miller, the original monographer of these rocks.

The position of the old red sandstone series is easily determined, though the sequence of the various beds which form it is somewhat obscure. All the rocks are situated between the beds of the Silurian and carboniferous periods. In Wales, Scotland, and Ireland it has been observed that there is an old series of red sandstones which are more or less conformable with the underlying Silurians, and a newer series unconformable with the older strata, but conformable with the overlying carboniferous rocks. The great interval represented by this break has been believed to be that during which the calcareous

Devonian rocks were depósited. The recent researches, however, of Mr. Salter show that the one set of beds do not alternate with the other, but that they are really contemporaneous—the coarse shallow water deposits of conglomerate and sandstone having been formed on the shores of that sea in whose depths the deposits of thicker mass, finer grain, and lighter color, full of marine shells and corals, were at the same time being aggregated.

The strata of the period have been arranged in four groups. 1. Upper old red sandstone, including the Marwood and Petherwin groups. 2. Middle old red sandstone, including the Dartmouth and Plymouth groups. 3. Lower old red sandstone, including the North Foreland and Torbay groups. 4. Tilestones or Ledbury Shales.

1. The upper old red sandstones are conformable with the inferior strata of the coal measures, and differ so little petrologically, or even paleontologically from them, that they have been considered as the basement series of that period. They consist of yellowish and light-colored sandstones, which are at Dura Den, in Fifeshire, remarkably rich in some of their layers in the remains of Holoptychius, Pterichthys, Dendrodus, etc. In the south of Ireland, and at Dunse, similar beds contain a fresh-water shell very like the modern anodon, and fragments of a fern called *cyclopteris hibernicus*. Mr. Saltar has shown, from the intercalation of the marine beds with the red sandstone, and from the identity of the fossils, that the Devonian representatives of these beds are the Marwood and Potherwin groups. These consist of dark-colored calcareous and argillaceous beds, and gray and reddish sandstones. The fossils found in them are shells and land-plants, many of them belonging to the same genera, but different species to those which are found in the carboniferous system. The little crustacean Cypridina and Clymenia are so characteristic of this division, that in Germany the strata are known as the Cypridinien Schieffer and Clymenien Kalk.

2. The middle old red sandstone is represented in the north of Scotland by the Caithness flags, a series of dark-gray bituminous schists, slightly micaceous or calcareous, and remarkably tough and durable. Throughout their whole thickness they are charged with fossil fish and obscure vegetable remains. The characteristic fishes belong to the genera Coccosteus, Asterolepis, and Dipterus. The corresponding beds in Devonshire are the Dartmouth and Plymouth groups, which consist of extensive deposits of limestones and schists, all of them abounding in the remains of corals, trilobites, and shells. In the German equivalent, the Eifel limestone, but especially in the Russian, the characteristic invertebrate fossils of the Devonshire calcareous beds have been found associated with the remains of Coccosteus, showing beyond doubt the identity of these various beds. The Calceola Schieffer of German geologists belongs to the middle old red; it receives its name from the abundance in it of a singular brachiopod (*calceola sandalina*).

3. The lower old red sandstone consists of strata of red shale and sandstone, with beds of impure arenaceous limestone (cornstone), and frequently at the base great deposits of red conglomerate. The fossils peculiar to this division are the remarkable fish cephalaspis, and the huge crustacea of the genus Pterygotus, besides a few shells. To the south of the Grampians, the strata consists of a gray paving-stone and coarse roofing-slate. The Devonian representatives of this section are the sandstones and slates of the North Foreland, Linton, and Torbay, and the series of slaty beds and quartz ore sandstones developed on the banks of the Rhine near Coblentz. The Cephalaspis, so characteristic of the cornstones, has been found in the Rhenish beds.

4. The tilestones or Ledbury Shales consist of finely laminated reddish and green micaceous sandstones, which have been noticed underlying the old red only on its western borders in Herefordshire. The fossils of those beds show a Silurian fauna with a number of old red forms; the tilestones are consequently referred sometimes to the one period, and sometimes to the other.

The old red sandstone occupies a considerable portion of the surface of Great Britain. In the north, it forms the boundary lands of the Moray firth; beginning even as far north as the Shetlands and Orkneys, it covers the whole of Caithness, and in more or less broken tracts the east of Sutherland, Ross, and Cromarty, and the north of Inverness, Nairn, and Elgin. In the great central valley of Scotland it is the setting in which the coal measures are placed, stretching across the country on the one margin from Forfar to Dumbarton, and occurring on the other in separated tracts in Lanark and Berwick. In the southern division of the island it is limited to a large triangular district in the southwest. The apex of the triangle is at Wenlock, in Shropshire; a line thence to Start point, in Devon, would limit it on the east, and a second to Milford haven would do so on the west. The Bristol channel bisects it. A depression in the Welsh portion is occupied with South Wales coal-field; and in a similar depression in Devon, the culm-beds are situated. In Ireland, strata of this age are found in the counties of Kilkenny, Waterford, Cork, and Kerry. The Devonian rocks have been carefully studied in Belgium and the Rhine district, and also in Russia, where they cover a larger district in the north of the empire. The American representatives of this period are extensively developed in New York, Pennsylvania, and Canada. The invertebrate animals found in the old red do not differ much from those of the Upper Silurian. Corals are remarkably abundant and beautiful in the Devonian limestones. Goniatites and Clymenia make their first appearance in this period, with several forms of lower mollusca. Trilobites are still numerous. But the most striking feature in the period is the abundance of fish of curious forms, strongly protected outside by hard bony cases, or by a dense armor of ganoid scales.

OLDTOWN, a t. in Penobscot co., Me., on the w. bank of Penobscot river, and the European and North American, and the Bangor and Piscatiquis railroads, 12 m. n. of Bangor; pop. '70, 4,529. It was set off from Orono in 1840, and consists of the four villages, Oldtown, Pushaw, Great Works, and Upper Stillwater. It has a heavy water power, and many saw and lumber mills, one of which is said to be the largest in the world. A boom built across the Penobscot at a cost of $100,000 keeps lumber from drifting out to sea. The lumber trade is the chief business; furniture, carriages, barrels, and shingles are also made. There are a number of churches and a bank. A railroad bridge spans the Penobscot at this point.

OLDYS, William, a most erudite and industrious bibliographer, was a natural son of Dr. William Oldys, chancellor of Lincoln, and advocate of the admiralty court, and was born in 1687. Regarding his early life little is known. His father dying in 1708 left him a small property, which Oldys squandered as soon as he got it into his own hands. The most of his life was spent as a bookseller's hack. He drank hard, and was so scandalously fond of low company that he preferred to live within the "rules" of the Fleet prison to any more respectable place. As may easily be supposed from his habits, the dissolute old bookworm was often in extremely necessitous circumstances, and when he died (April 15, 1761) he left hardly enough to decently bury him. It is but fair to add that Oldys had some sterling merits. Capt. Grose, who knew him, praises his good-nature, honor, and integrity as a historian, and says that "nothing would ever have biased him to insert any fact in his writings which he did not believe, or to suppress any he did." For about ten years Oldys acted as librarian to the earl of Oxford, whose valuable collection of books and MSS. he arranged and catalogued. His chief works are: *The British Librarian, Exhibiting a Compendious Review of all Unpublished and Valuable Books in all Sciences* (London, 1787, anonymously); a *Life of Sir Walter Raleigh*, prefixed to Raleigh's *History of the World* (1738); a translation of Camden's *Britannia* (2 vols.): *The Harleian Miscellany, or a Collection of Scarce, Curious, and Entertaining Tracts* (8 vols. Lond. 1753). Besides these, Oldys wrote a great variety of miscellaneous literary and bibliographical "articles" for his friends the booksellers, which it would be tedious to mention.

OLEA'CEÆ, a natural order of exogenous plants, consisting of trees and shrubs, with opposite leaves and flowers in racemes or panicles. The calyx is in one piece, divided, persistent; the corolla is hypogynous, generally 4-cleft, sometimes of four petals, sometimes wanting; there are generally two, rarely four stamens; the ovary is free, 2-celled, the cells 2-seeded; the fruit is a drupe, a capsule, or a samara (see these heads); the cotyledons are foliaceous. Nearly 150 species are known, mostly natives of temperate countries. Among them are the olive, ash, lilac, privet, phillyrea, fringe tree, etc. Between some of these there is a great dissimilarity, so that this order is apt to be regarded as a very heterogeneous group; but the real affinity of the species composing it is manifested by the fact that even those which seem most unlike can be grafted one upon another, as the lilac or the olive on the ash. Bitter, astringent, and tonic properties are prevalent in this order.

OLEAN'DER, *Nerium*, a genus of plants of the natural order *apocynaceæ*, having a 5-parted calyx, set round on the inside at the base with many tooth-like points or glands, a salver-shaped 5-cleft corolla, in the throat of which is a 5-parted and toothed or lacerated corona, five stamens, the anthers adhering to the stigma, the fruit composed of two follicles. The species are evergreen shrubs with leathery leaves, which are opposite or in threes; the flowers in false umbels, terminal or axillary. The Common Oleander (*N. oleander*), a native of the south of Europe, the north of Africa, and many of the warmer temperate parts of Asia, is frequently planted in many countries as an ornamental shrub, and is not uncommon in Britain as a window-plant. It has beautiful red or sometimes white flowers. The English call it Rose Bay, and the French Rose Laurel (*laurier rose*). It attains a height of 8 or 10 feet. Its flowers give a splendid appearance to many ruins in the south of Italy. It delights in moist situations, and is often found near streams. All parts of it contain a bitter and narcotic-acrid juice, poisonous to men and cattle, which flows out as a white milk when young twigs are broken off. Cases of poisoning have occurred by children eating its flowers, and even by the use of the wood for spits or skewers in roasting meat. Its exhalations are injurious to those who remain long under their influence, particularly to those who sleep under it. A decoction of the leaves or bark is much used in the south of France as a wash to cure cutaneous maladies.—*N. odoratum*, an Indian species, has larger flowers, which are very fragrant.—*N. piscidium* (or *Eschaltum piscidium*), a perennial climber, a native of the Kasya hills, has a very fibrous bark, the fiber of which is used in India as hemp. The steeping of the stems in ponds kills fish.

OLEAS'TER. See Elæagnus.

OLE BULL. See Bull, Ole Bornemann, *ante*.

O'LEFIANT GAS (C_4H_4) is transparent and colorless, possesses a disagreeable alliaceous odor, and acts as a poison when breathed. Its specific gravity is 0.981. It takes fire when brought in contact with a flame, and burns with a bright clear light. When this gas is mixed with oxygen or atmospheric air in the proportion of 1 volume with 3 volumes of oxygen, or with 15 volumes of atmospheric air, it forms a powerfully explosive mixture. It is more soluble in cold than in hot water—100 volumes of water at 32° absorbing 26.5 volumes of the gas, while at 68° they only absorb 14 volumes. It was liquefied by Faraday under great pressure, but remained unfrozen at 166°. If it be conducted through strongly-heated tubes, or if a continuous series of electric sparks be passed through it, it is decomposed into a very dense black carbon, and double its own volume of hydrogen; and if it is subjected to a less intense heat, the products of decomposition are carbon and light carbureted hydrogen or marsh gas (C_2H_4). Chlorine acts upon this gas in a very remarkable manner. When the two gases are mixed in equal volumes, they combine to form a heavy oily liquid, to which the term chloride of olefiant gas, or Dutch liquid (q.v.), is given. It is from this reaction that the term *olefiant* was originally applied to this gas.

Olefiant gas is a constituent of the gaseous explosive admixtures that accumulate in coal-pits, and of the gaseous products yielded by the distillation of wood, resinous matters, and coal; and the brightness of the flame of ordinary gas is in a great measure dependent upon the quantity of olefiant gas that is present.

This gas is most readily obtained by the action of oil of vitriol on alcohol; the reactions that ensue are too complicated to be described in these pages.

O'LEIC ACID ($C_{36}H_{33}O_3,HO$), at temperatures above 57°, exists as a colorless limpid fluid, of an oily consistence, devoid of smell and taste, and (if it has not been exposed to air) exerting no action on vegetable colors. At 40° it solidifies into a firm, white, crystalline mass, and in this state it undergoes no change in the air; but when fluid it readily absorbs oxygen, becomes yellow and rancid, and exhibits a strong acid reaction with litmus paper. It is not a volatile acid, and on the application of a strong heat it breaks up into several substances, such as caproic, caprylic, and sebacic acids—the last named being the most charactersitic product of the distillation. If oleic acid be exposed to the action of hyponitric acid (NO_4), it is converted into an isomeric, solid, fatty acid, termed *elaidic acid*. A very small quantity of hyponitric acid (1 part to 200 of oleic acid) is sufficient to effect this remarkable change, the nature of which is unknown. When distilled with moderately strong nitric acid, it is oxidized into a large number of products, including all the volatile fatty acids represented by the formula $C_{2n}H_{2n}O_4$, from formic acid ($C_2H_2O_4$) to capric acid ($C_{20}H_{20}O_4$), with six fixed dibasic acids of the formula $C_{2n}H_{2n-2}O_8$, viz., succinic acid, lipic acid, adipic acid, pimelic acid, suberic acid, and anchoic (or lepargylic) acid. When heated with hydrated potash it breaks up into palmitic and acetic acids, as shown in the equation:

$$\overbrace{C_{36}H_{34}O_4}^{\text{Oleic Acid.}} + \overbrace{2(KO,HO)}^{\text{Hydrated Potash.}} = \overbrace{C_{32}H_{31}O_3,KO}^{\text{Palmitate of Potash.}} + \overbrace{C_4H_3O_3,KO}^{\text{Acetate of Potash.}} + 2H$$

These decompositions and disintegrations seem to illustrate the facility with which, by the mere process of oxidation, which is perpetually at work in living structures, one organic acid can be converted into others.

Oleic acid is a constituent of *oleine* (q.v.), which exists in most of the fats and fatty oils of the animal and vegetable kingdoms, and most abundantly in the liquid fats or oils, and hence its name is derived. It is very difficult to obtain the acid in a state of purity, in consequence of the readiness with which it oxidizes; and we shall not enter into details regarding the method of its preparation. It is obtained in a crude form, as a secondary product, in the manufacture of stearine candles, but almond oil is generally employed when the pure acid is required.

Oleic acid forms normal (or neutral) and acid salts; but the only compounds of this class that require notice are the normal salts of the alkalies. These are all soluble, and by the evaporation of their aqueous solution form *soaps*. Oleate of potash forms a soft soap, which is the chief ingredient in Naples soap; while oleate of soda is a hard soap, which enters largely into the composition of Marseilles soap.

The oleates of the alkalies occur in the animal body, in the blood, chyle, lymph, and bile; they have also been found in pus, in pulmonary tubercles, and in the excrements, after the administration of purgatives.

O'LEINE ($C_{114}H_{104}O_{12}$) is proved, by the researches of Berthelot, to be a triglyceride of oleic acid. See GLYCERINE. Pure oleine is a colorless and inodorous oil, which solidifies into acicular crystals at about 23°, is insoluble in water, and only slightly soluble in cold alcohol, but dissolves in ether in all proportions. By exposure to the air it darkens in color, becomes acid and rancid (from the gradual decomposition of the oleic acid), and finally assumes a resinoid appearance. Hyponitric acid converts it into an isomeric, white, solid fat, named *elaidine*—the glyceride of the elaidic acid described in the preceding article.

Pure oleine is obtained by cooling olive oil to 32°, which occasions the separation of the stearine and palmitine in a solid form. The fluid portion is then dissolved in alcohol, which on being cooled to 32° deposits in a solid form everything but oleine, which is obtained in a pure state by driving off by heat the alcohol from the decanted or filtered solution.

The drying oils, such as those of linseed, hemp, walnut, poppy, etc., contain a variety of oleine, which is not converted into elaidine by the action of hyponitric acid, or of subnitrate of mercury, which, when prepared without the aid of heat, contains enough of the acid to produce a similar effect. Hence these substances may be used to detect fraudulent adulterations of olive or almond oil with poppy and other cheap drying oils.

OLEOMARGARINE, from the Latin *oleum*, oil, and *marga* (the latter from the Greek *margarete*) a pearl; margarine being the solid derived from olive and other oils under pressure, and so-called from its pearl-like appearance. The name is applied to a product of beef fat, and was given to it by act of the legislature of New York, with a view to prevent the sale of the article as dairy butter, by having it stamped or branded legibly with this name under penalty duly applied for neglect thereof. The material of which the article is manufactured is beef fat, excepting the suet and the fat of the kidneys, which parts are left in the carcass for the butcher. The caul and the enveloping fat of the intestines only are employed—except in cases of adulteration. The process of manufacture is as follows: the beef carcass having been permitted to hang until the animal heat has entirely left it, the fat is placed in tanks of cold water and thoroughly cleansed from all impurities, this process being three times repeated. It is next conveyed to the cutting-machine, an instrument supplied with revolving knives, which cut it into small bits, when it is forced as a pulp through a screen or colander. This pulp is now placed in the melting-kettle, in which it is subjected to a heat of 112° to 118° F., being at the same time vigorously stirred by an *agitator*, or paddler, worked by machinery. From the melting-kettle the melted fat is run into a series of vats, the refuse or residuum passing through a valve in the bottom of the kettle, and into receptacles for tallow. From the vats the oil is transported in metal-lined coolers (wagons drawn by hand) to a room which is kept at a temperature of 85° to 87°, where it becomes a granulated mass. In this form it is served to the hydraulic presses by the following method: an upright shaft, having a revolving horizontal wheel at the top, stands at a convenient height from the ground for service. On the outer extremity of the spokes of this wheel are arranged boxes in which the material is placed, being first packed in cloths; it thus takes form, like that of a square loaf of bread, being then transferred to metal plates in the press, plate after plate being covered in layers until the press is full. The power is then applied, when the pure oil runs off into a reservoir, and the residue (stearine) is left in thin white sheets resembling paraffine. These are afterwards collected and packed in hogsheads, for disposal to those who make use of the article. The solid elements of the fat have now been entirely eliminated in the stearine, the tallow, and the refuse—the latter being the wash of the coolers, which is obtained by thoroughly scalding the latter. This is afterwards run through gutters into the tallow-room. Here it passes into a large tank, from which it is removed in barrels to an iron vat resembling a vertical boiler, where it is put under steam-pressure and the tallow obtained; the whole of which goes to the soap manufacturers and tallow-chandlers, the final refuse in the iron vat being expelled through a manhole, packed in casks, and disposed of for fertilizing purposes. From the press-room reservoir, the oil is pumped to the butter-room, where it is received in large churns worked by steam-power. In these, after being combined with a proportion of one-fifth milk, it goes through a churning process which occupies about forty minutes. From the churns the product is run into coolers containing broken ice, with which it is thoroughly mixed to solidify it, being afterwards separated from the ice on tables. The butter, being of unequal consistency and temperature, is next passed through a machine called a crusher, out of which it comes a perfectly homogeneous mass. It now goes to the salting-table, where it is salted and worked, after which it is packed in boxes, firkins, and barrels, every package being branded "oleomargarine" according to law. This manufacture in New York amounts to about 350,000 lbs. per week; there are manufactories in other cities as to which no statistics are available. In 1880 the article interfered so greatly with the sale of dairy butter, particularly in competition with the export trade in the latter, through false representation, as to arouse a powerful opposition to its manufacture and sale, both on the part of dairymen, and that of the New York produce exchange.

OLEOM'ETER, or ELAÏOMETER, an instrument for ascertaining the densities of fixed oils. It consists of a very delicate thermometer-tube, the bulb being large in proportion to the stem. It is divided into fifty degrees, and floats at zero in pure oil of poppy-seed, at 38° to 38¼° in pure oil of almonds, and at 50° in pure olive oil.

O'LEOPHOSPHO'RIC ACID is a yellow viscid substance, which is insoluble in water and cold alcohol, but dissolves readily in boiling alcohol and in ether. When boiled for a long time with water or with alcohol, or when treated with an acid, it resolves itself into oleine and phosphoric acid; while alkalies decompose it into phosphoric acid, oleates, and glycerine. It exists, according to Frémy and other chemists, in the brain, spinal cord, kidneys, and liver.

OLERON, ISLE OF (anc. *Uliarus*), an island of France, forming a portion of the department of Charente-Inférieure, lies off the w. coast of France, opposite the mouth of the river Charente. It is 19 m. long, and about 5 m. broad, and is unusally fertile, producing abundantly all the crops grown in the department to which it belongs. See CHARENTE-INFÉRIEURE. At its northern extremity, is the light-house of Chassiron. In the sea-port of Oléron, distilleries, rope-walks, and ship-building yards are in operation. The town of Sainte-Pierre-d'Oléron (pop. 1,575) stands near the center of the island. The pop. of the island is given at 10,000.

OLERON, LAWS OF, or JUDGMENTS D'OLÉRON, a celebrated code of maritime law compiled in France in the reign of St. Louis, and so named from a groundless story, that it was enacted by Richard I. of England during the time that his expedition to Palestine lay at anchor at that island. The real origin of these laws was a written code, called *Il Consolato del Mare*, of about the middle of the 13th c., compiled either at Barcelona or at Pisa, forming the established usages of Venice and the other Mediterranean states, and acceded to by the kings of France and counts of Provence. Besides containing regulations simply mercantile, this system defined the mutual rights of belligerent and neutral vessels, as they have been since understood in modern international law. The so-called laws of Oléron were a code of regulations borrowed from the *Consolato*, which for several centuries were adopted as the basis of their maritime law by all the nations of Europe. Copies of the *Jugements d'Oléron* are appended to some ancient editions of the *Coutumier de Normandie*. See NORMANDY, CUSTOMARY LAW OF.

OLGA, SAINT, a saint of the Russian church, wife of the duke Igor of Kiev, who, having undertaken an expedition against Constantinople, which proved unsuccessful, was slain on his return to his own dominions. His widow Olga avenged his death, assumed the government in his stead, and for many years governed with much prudence and success. Having resigned the government to her son Vratislaf about the year 952, she repaired to Constantinople, where she was baptized, by the patriarch Theophilaktes, and received into the church, assuming at baptism the name of Helena, in honor of St. Helena, mother of Constantine. She returned to Russia, and labored with much zeal for the propagation of her new creed; but she failed in her attempt to induce her son, Swåntoslav, to embrace Christianity. Her grandson, Vladimir, having married Chrysoberga, the sister of the emperors of Constantinople, Basil and Constantine, was baptized in the year 988; but his grandmother did not live to enjoy this gratification, having died in 978, or, according to other authorities, as early as 970. She is held in high veneration in the Russian church. Her festival is held on July 21, and the practice of venerating her appears to date from the early period of the Russian church, before the schism between the Eastern and Western churches.

OLHÃO', a t. of Portugal, on the sea-coast, near Cape de St. Maria, and 5 m. e. from Faro. Pop. 7,025.

OLIB'ANUM, a gum-resin, which flows from incisions made in *boswellia serrata*, a tree found in some parts of the east. See BOSWELLIA. It is the *lebonah* of the Hebrews, *libanos* or *libanotos* of the Greeks, *thus* of the Romans, of all which terms the ordinary English translation is *frankincense* (q.v.). It occurs in commerce in semi-transparent yellowish tears and masses; has a bitter nauseous taste; is hard, brittle, and capable of being pulverized; and diffuses a strong aromatic odor when burned. It was formerly used in medicine, chiefly to restrain excessive mucous discharges; but its use for such purposes is now rare. It sometimes enters as an ingredient into stimulating plasters. It is chiefly employed for fumigation, and is used as incense in Roman Catholic churches. It is sometimes distinctively called *Indian olibanum;* a similar substance, in smaller tears, called *African olibanum*, being produced by *boswellia papyrifera*, a tree found growing on bare limestone rocks in the e. of Abyssinia, and sending its roots to a great depth into the crevices of the rock. The middle layers of the bark are of fine texture, and are used instead of paper for writing.

O'LIFANT'S RIVER. Two considerable streams of this name are found in the cape Colony. The Olifant's river west rises in the Winterhoek mountains, and enters the Atlantic in lat. 31° 40', after a course of 150 m., and a basin of drainage of 25,000 sq.m.—The Olifant's river east drains a great part of the district of George, and joins the Gauritz river 60 m. above the entrance of that river into the sea. Its course is upwards of 150 m. in length, and it is more available for irrigation than almost any other cape river.

O'LIGARCHY (*oligos*, few, and *archo*, to govern), a term applied by Greek political writers to that perversion of an aristocray in which the rule of the dominant part of the community ceases to be the exponent of the general interests of the state, owing to the cessation of those substantial grounds of pre-eminence in which an aristocracy originated. The governing power in these circumstances becomes a faction, whose efforts are chiefly devoted to their own aggrandizement and the extension of their power and privileges.

OLIGOCHÆTA, an order of annelids, of which the common earth-worm is a good example. Their locomotive appendages are in the form of bristles attached in rows to the sides and ventral surface of the body; no branchiæ; all hermaphrodite; young pass through no metamorphosis. The order is divided into two families, *terricolæ* or earth-worms, and *limicolæ* or mud-worms and water-worms. These families have also been named, respectively, *lumbricidæ* and *naidæ*. In the *lumbricus* or common earth-worm (q.v.), the edentulous mouth opens by a muscular pharynx and short œsophagus to a muscular crop or *pro-ventriculus*, succeeded by a second muscular stomach or gizzard. Salivary glands open into the pharynx, and other digestive glands open into the gullet. The perivisceral cavity is lined by a cellular membrane, which is continuous with a yellow cellular layer covering the intestine and large vessels, and which casts off its cells into the perivisceral fluid. The blood circulating in the pseudo-hemal system is non-corpusculated, although red, while that contained in the body cavity is colorless, but contains corpuscles. In all the oligochæta the segmental organs communicate with the perivisceral cavity, and also externally with the outer medium. The most common example of the naidæ is the *tubifex rivulorum*, found in the mud of ponds and streams. It is 1 or 1½ in. long and of a bright red color. The pseudo-hemal system is provided with two contractile cavities or hearts, and a system of tubes similar to that in the earth-worm, and also a system of lateral tubes opening externally. The reproduction is both non-sexual and sexual. Before maturity the young naïs throws out a bud between two rings, at a point generally near the middle of the body, and the strange phenomenon of this bud developing into a new individual, as well as each of the two parts of the parent on either side of this point, takes place. That portion of the parent in front of the bud develops a tail, whilst the portion behind the bud develops a head. Besides their non-sexual reproduction the naidæ after going through a metamorphosis attain sexual reproduction.

OLIN, Henry, 1757–1837; b. Vermont, and spent his earlier years in Addison county. He was a member of the general assembly consecutively from 1799 till 1825, excepting four years; also a member of three constitutional conventions. He was associate judge in 1801, chief judge in 1807, member of congress in 1824, and lieut.-gov. in 1827 Stephen Olin, the Methodist minister and educator, was his son.

OLIN, Stephen, d.d., ll.d.; 1797–1851; b. Vt.; oldest son of Henry, who was judge of the supreme court of Vermont, member of congress, and lieut.-gov. The son graduated at Middlebury college in 1820, with the highest honors of his class. His health being impaired by intense study, he went to South Carolina, and became the principal of Abbeville academy. While there, he abandoned the study of law which he had commenced, and entered the ministry of the Methodist Episcopal church, and in 1824 was admitted to the South Carolina conference. He was stationed in Charleston for two years, where, associated with another, he preached to four congregations, in which were 3,000 slaves. Of these he received 200 into the church. In July, 1826, he was elected professor of English literature in the university of Georgia, where he remained seven years. In 1834 he was inaugurated president of Randolph Macon college, Va., which under his administration had great prosperity. In 1837–41 he made an extended tour in Europe and the east, and in 1843 published in 2 vols. *Travels in Egypt, Petra, and the Holy Land*. His account of Egypt was pronounced "the best, on the whole, in the language." In his *Travels* he spoke of "a broken arch supposed to be the remains of an ancient bridge connecting the Temple with Mount Zion, as having been known to Mr. Catherwood, and other travelers and residents," for which he was accused in the *North American Review* of plagiarism, Dr. Robinson in his *Biblical Researches* and in the *Bibliotheca Sacra*, having claimed to be the discoverer of this monument, and especially to have been the first to recognize in this fragment of an arch the remnant of the bridge spoken of by Josephus. A controversy ensued, in which Dr. Olin positively denied the charge of plagiarism, supporting his denial by the testimony of two missionaries, the rev. Dr. Hamlin and the rev. Mr. Homes, the latter declaring that he himself informed Dr. Robinson of the existence of the arch as a remnant of the bridge mentioned by Josephus. In 1842 Dr. Olin was elected president of the Wesleyan university in Middletown, Conn., where he remained till his death. During his administration the college prospered greatly, and attained a high rank. He excelled as an educator. He contributed to the *Wesleyan Journal*, *The Christian Advocate and Journal*, and the *Methodist Quarterly Review;* two volumes of *Sermons, Lectures, and Addresses*, also a work entitled *Greece and the Golden Horn* appeared after his death. In 1853 were published his *Life and Letters*, edited by Mrs. Olin, assisted by Dr. McClintock, Dr. Holdich, and other friends. The *New Englander* says of him: "He had the real celestial fire of sacred oratory. He had great power of insight and logic; but his chief strength lay in the enkindling and electric energy of his sympathetic and emotional nature."

OLINDA, a suburb of Pernambuco (q.v.).

OLIN'DA, a city of Brazil, in the province of Pernambuco, and 4 m. n.e. from Pernambuco. It was formerly the capital of the province, and there were bloody contests between Spain and Holland for the possession of it. It is still a bishop's seat, Pernambuco being included in the diocese. The whole aspect of the town is that of a place half deserted. Pop. 8,000.

OLINDA, Pedro de Araujo Lima, Marquis of, 1790–1870; b. in Pernambuco, Brazil; educated there and studied law at the university of Coimbra, Portugal. In 1820 he became a member of the Portuguese assembly, and on his return to Brazil was elected to that of Brazil, and was a member until his death. He was three times president of the chamber of deputies, four times minister of state, and twice regent in the minority of Pedro II. He was made viscount in 1841, and marquis in 1854. In politics he was liberal but not a radical.

OLIPHANT, LAURENCE, b. England, 1829; son of sir Anthony, chief justice of Ceylon. He went to India when quite young, and visited the Nepaulese court. He published in 1852 a description of this visit, under the title of *A Journey to Katmandhu, or the Nepaulese Ambassador at Home.* He read law at the university of Edinburgh, and was admitted to the Scotch, and afterwards to the English bar. In 1852 he traveled through Russia and the Crimea, an account of which tour appeared in 1853 as *The Russian Shores of the Black Sea.* He was appointed private secretary to the earl of Elgin, gov.gen. of Canada, and was for a time superintendent of Indian affairs in Canada. In 1855 he he published an account of his travels in the United States and Canada, called *Minnesota and the Far West;* and soon afterwards a pamphlet on the Crimean war, called *The Coming Campaign.* In 1856 appeared his *transcaucasian Campaign under Omer Pasha.* He went to China in 1857, as private secretary and historiographer to lord Elgin. In 1860 he published *A Narrative of the Earl of Elgin's Mission to China and Japan;* and *Patriots and Filibusters; Incidents of Travel.* In 1861 he was *chargé d'affaires* in Japan, where he was dangerously wounded by assassins. He was returned to parliament in 1865, but resigned in 1868, when, with his mother, lady Oliphant, he joined the community of the "brotherhood of the new life" at Portland, Chautauqua co., N. Y., where he remained for about two years. In 1870 he was at Paris, a correspondent of the London *Times,* and he was the American manager of the direct cable company, 1873–75. He published in 1870 *Piccadilly; a Fragment of Contemporaneous Biography,* and in 1881, *The Land of Gilead.* The latter work contains an account of his travels in Palestine for the purpose of finding a site for a proposed colony.

OLIPHANT, Mrs. MARGARET (*née* WILSON), one of the most distinguished of our living female novelists, was born about the year 1820. The prevalent impression that she is a Scotchwoman, naturally enough derived from the obvious fondness with which in her earlier works she has treated Scottish character and incident, is not strictly correct. She is a native of Liverpool; her mother was, however, a Scotchwoman of a somewhat remarkable type, strongly attached to old traditions. In 1849 Mrs. Oliphant published her first work, *Passages in the Life of Mrs. Margaret Maitland of Sunnyside,* which instantly won attention and approval. Its most distinctive charm is the tender humor and insight which regulate its exquisite delineation of Scottish life and character at once in their higher and lower levels. This work was followed by *Merkland* (1851); *Adam Graeme of Mossgray* (1852); *Harry Muir* (1853); *Magdalen Hepburn* (1854); *Lilliesleaf* (1855); and subsequently by *Zaidee, Katie Stewart,* and *The Quiet Heart,* which originally appeared in succession in *Blackwood's Magazine.* Though these are of somewhat various merit, in all of them the peculiar talent of the writer is marked. They are rich in the minute detail which is dear to the womanly mind; have nice and subtle insights into character, a flavor of quiet humor and frequent traits of delicacy and pathos in the treatment of the gentler emotions. It is, however, on the *Chronicles of Carlingford* that her reputation as a novelist was first secured. In the first of the two sections separately published, apart from its other merits, which are great, the character of little Netty, the heroine, vivifies the whole work, and may rank as an original creation. The other, *Salem Chapel,* perhaps indicates a wider and more vigorous grasp than is to be found in any other work of the authoress. Certain of the unlovelier features of English dissent, as exhibited in a small provincial community, are here graphically sketched, and adapted with admirable skill to the purposes of fiction. The intrusion, however, in some portion of the work of a "sensational" element, as it is termed, though it subserves intensity of interest, must be noted as a little defective in art. In 1870, she published *Three Brothers;* in 1871, *Squire Arden;* in 1872, the most subtly thought and gracefully written of all her novels, *Ombra;* in 1874, *A Rose in June;* and in 1876, *Phœbe Junior.* Mrs. Oliphant has also published *Life of Edward Irving; St. Francis of Assisi; Memoir of the Comte de Montalembert;* and *The Makers of Florence.*

OLIVA, a genus of gasteropod mollusks of the family *buccinidæ,* order Prosobranchiata. See INVERTEBRATE ANIMALS, sub-kingdom mollusca, division B, mollusca proper, class II., Gasteropoda, section A, order I., family 3. They are sometimes classed with the *volutidæ,* see as above, family 5. The genus has the following characters: animal involved, compressed, with a small head terminated by a proboscis; tentacles approximated, enlarged at their base, and subulate at their extremities, carrying the eyes on small convexities about their middle part externally; foot very large, oblong, and slit transverse anteriorly; mantle with a single lateral lobe covering the shell in great part, with two tongue-like processes at the side of the branchial opening, and forming in front a very elongated siphon; a single branchial pectination. Oliva is one of the richest in color of shell and in variety of species, which form considerable sections in the cabinets of many collectors. *O. textilina,* the "astrolabe," has a cinereous white shell, subreticulated with flexuous dotted lines, with two brown bands, covered with characters, as though hieroglyphic. This beautiful shell with its animal is found in the Antilles and New Guinea. *O. maura* has a cylindrical shell, with the apex rounded and a slight depression (retuse); aperture white, East Indian ocean and Australia. *O. sanguinolenta* has a cylindrical shell, very beautifully and delicately reticulated, with reddish-brown small lines, girt with two brown zones; the pillar orange-red. It is found in the East Indian ocean and on the coast of Timor. These species have been found at various depths, from the surface to 12 fathoms, on mud, sandy mud, coarse sand, etc. They are very carnivorous, but live only upon the juices of other animals. They are taken at the Mauritius in the following manner: a line is secured in position near the bottom of the sea, to which short lines with nooses containing pieces of the arms of cuttle fish are attached, so that they touch the bottom. After the apparatus has remained for a time in position one end is raised from a boat, and examined along its course, and the animals which adhere to the cuttle fish removed.

OLIVAREZ, Don Gasparo de Guzman, Count of, duke of San Lucar, and prime-minister of Philip IV. of Spain, was b. Jan. 6, 1587, at Rome, where his father was ambassador. He belonged to a distinguished but impoverished family, received a learned education, became the friend of Philip IV., his confidant in his amours, and afterwards his prime-minister, in which capacity he exercised almost unlimited power for 22 years. Olivarez showed ability for government, but his constant endeavor was to wring money from the country that he might carry on wars. His oppressive measures caused insurrections in Catalonia and Andalusia, and roused the Portuguese to shake off the Spanish yoke in 1640, and make the duke of Braganza their king, an event which Olivarez reported to Philip with satisfaction, as it enabled him to confiscate the duke's great estates in Spain. But the arms of Spain being unsuccessful, the king was obliged to dismiss the minister in 1643. He would probably have been recalled to the head of affairs, but for a publication in which he gave offense to many persons of influence. He was ordered to retire to Toro, and confine himself to that place, where he died, July 12, 1645. (Cespedes, *Hist. De Felipe IV.*)

OLIVE, *Olea*, a genus of trees and shrubs of the natural order *oleaceæ;* having opposite, evergreen, leathery leaves, which are generally entire, smooth, and minutely scaly; small flowers in compound axillary racemes, or in thyrsi at the end of the twigs; a small 4-toothed calyx, a 4-cleft corolla, 2 stamens, a 2-cleft stigma; the fruit a drupe. The species are widely distributed in the warmer temperate parts of the globe. The Common Olive (*O. Europæa*), a native of Syria and other Asiatic countries, and perhaps also of the s. of Europe, although probably it is there rather naturalized than indigenous, is in its wild state a thorny shrub or small tree, but through cultivation becomes a tree of 20–40 ft. high, destitute of spines. It attains a prodigious age. The cultivated varieties are very numerous, differing in the breadth of the leaves, and in other characters. The leaves resemble those of a willow, are lanceolate, entire, of a dull dark-green color above, scaly and whitish-gray beneath; the flowers small and white, in short dense racemes; the fruit greenish, whitish, violet, or even black, never larger than a pigeon's egg, generally oval, sometimes globular, or obovate, or acuminate. The fruit is produced in vast profusion, so that an old olive-tree becomes very valuable to its owner. It is chiefly from the pericarp that olive oil is obtained, not from the seed, contrary to the general rule of the vegetable kingdom. Olive oil is much used as an article of food in the countries in which it is produced, and to a smaller extent in other countries, to which it is exported also for medicinal and other uses (see Oils). Olives, gathered before they are quite ripe, are pickled in various ways, being usually first steeped in lime-water, by which they are rendered softer and milder in taste. They are well known as a restorative of the palate, and are also said to promote digestion. Disagreeable as they generally are at first, they are soon greatly relished, and in the s. of Europe are even a considerable article of food. Dried olives are there also used, as well as pickled olives.—The wood of the olive-tree takes a beautiful polish, and has black cloudy spots and veins on a greenish-yellow ground; it is principally used for the finest purposes by cabinet-makers and turners. The wood of the root is marked in a peculiarly beautiful manner, and is used for making snuff-boxes and small ornamental articles. The bark of the tree is bitter and astringent; and both it and the leaves have febrifuge properties. A gum resin exudes from old stems, which much resembles storax, has an odor like vanilla, and is used in all parts of Italy for perfumery.—Among the Greeks the olive was sacred to Pallas Athene (Minerva), who was honored as the bestower of it; it was also the emblem of chastity. A crown of olive-twigs was the highest distinction of a citizen who had merited well of his country, and the highest prize of the victor in the Olympic games. An olive branch was also the symbol of peace (compare Gen. viii. 11); and the vanquished, who came to supplicate for peace, bore olive branches in their hands.—The olive has been cultivated in Syria, Palestine, and other parts of the east, from the earliest times. Its cultivation extends southwards as far as Cairo, and northwards to the middle of France. It is very generally propagated by suckers, but where great care is bestowed on it, inarching is practiced. It grows from cuttings. The climate of England is too cold for the olive, yet in Devonshire it ripens its fruit on a s. wall.—*Olea similis* and several other species are useful trees of s. Africa, yielding a very hard and extremely durable wood. Some of them bear the name of Ironwood at the cape of Good Hope. The American Olive (*O. Americana*) is also remarkable for the hardness of its wood. It is found as far n. as Virginia. It is a tree of 30–35 ft. high, with much broader leaves than the common olive. Its fruit is fit for use. Its flowers are fragrant. The Fragrant Olive (*O. fragrans*, or *Osmanthus fragrans*) of China and Japan has extremely fragrant flowers, which are used by the Chinese for flavoring tea.

O'LIVENITE, a mineral consisting chiefly of arsenic acid and protoxide of copper, with a little phosphoric acid and a little water. It is generally of some dark shade of green, sometimes brown or yellow. It is found along with different ores or copper in Cornwall and elsewhere. It is often crystalized in oblique four-sided prisms, of which the extremities are acutely beveled, and the obtuse lateral edges sometimes truncated, or in acute double four-sided pyramids; it is sometimes also spherical, kidney-shaped, columnar, or fibrous.

OLIVEN'ZA, a t. of Spain, near the Portuguese frontier, 19 m. s. by w. from Badajoz, on a small river which flows into the Guadiana. The chief branches of industry are the expressing of oil, weaving, and the making of earthenware. From the treaty for the cession of Olivenza by Portugal to Spain in 1801, Godoy acquired his title of prince of the peace. Pop. 10,000.

OLIVER, Andrew, 1706–74; b. Boston; educated at Harvard college, and in 1743 elected to the general court, in which he served three terms. He was a member of the council, 1746–65, and secretary of the province, 1756–70. He succeeded Hutchinson as lieut.gov. in 1771. After the passage of the stamp act by parliament in 1765, he took the place of stamp-distributor, but was forced to resign after having been hanged in effigy on the "liberty tree." He was a brother-in-law of Hutchinson, whose political course he followed, and of whose unpopularity he had a full share. The zeal with which he seconded the measures of the British ministry was evident in his letters, which were sent over to this country by Franklin in 1772, and the general court petitioned George III. for his removal.

OLIVER, Peter, LL.D., 1713–91; b. England; brother of Andrew, lieut.gov. of Massachusetts in 1770; graduated at Harvard, 1730. Not regularly bred to the law, he adopted that profession, and on Sept. 14, 1756, was appointed judge of the supreme court, and in 1771 chief-justice. When the colonies assumed control of their own judicial affairs, and sides were taken on the question of loyalty to the crown, he espoused the tory cause, and in Mar., 1774, refused the compensation offered him for his services, when required to give his word not to receive either pay or emolument from any other source than the assembly. He was impeached, and fled from Boston with the British troops in 1776. He was pensioned by the British government, and Oxford, in 1776, conferred upon him the degree of LL.D. His son Peter was a graduate of Harvard, class of 1761, practiced medicine in Middleborough, also returned to England, and died there in 1822, at the age of 80. Peter, the elder, contributed a number of articles to *The Censor*, a tory paper, and published *Speech on the Death of Isaac Lothrop* (1750); *Poem on the Death of Sec. Willard* (1757); *Scriptural Lexicon* (1784–85); new ed. 1832. He transcribed the manuscript history of Wm. Hubbard, and collected many valuable records of the old colony, which he carried with him to England.

OL'IVES, MOUNT of, called also Mount Olivet, an inconsiderable ridge lying on the e. side of Jerusalem, from which it is only separated by the narrow valley of Jehosaphat. It is called by the modern Arabs Jebel-el-Tur, and takes its familiar name from a magnificent grove of olive-trees which once stood on its western flank, but has now in great part disappeared. The road to mount Olivet is through St. Stephen's gate, and leads by a stone bridge over the now almost waterless brook Cedron. Immediately beyond, at the foot of the bridge, lies the garden of Gethsemane; and the road here parts into two branches, northwards toward Galilee, and eastwards to Jericho. The ridge rises in three peaks, the central one of which is 2,556 ft. above the level of the sea, and 416 ft. above the valley of Jehosaphat. The southern summit is now called "the mount of Offense," and was the scene of the idolatrous worship established by Solomon for his foreign wives and concubines. The northern peak is the supposed scene of the appearance of the angels to the disciples after the resurrection, and is remarkable in Jewish history as the place in which Titus formed his encampment in the expedition against the fated city of Jerusalem. But it is around the central peak, which is the mount of Olives properly so called, that all the most sacred associations of Christian history converge. On the summit stands the church of the Ascension, built originally by St. Helen, the modern church being now in the hands of the Armenian community; and near it are shown the various places where, according to tradition, our Lord wept over Jerusalem, where the apostles composed the apostles' creed, where our Lord taught them the Lord's prayer, etc. Near the church of the Ascension is a mosque and the tomb of a Mohammedan saint. In the garden of Gethsemane, at the foot of the hill, is shown the scene of our Lord's agony. The northern peak spreads out into a plain of considerable extent, which is painfully notable in Jewish history as the place where, after the Jews on occasion of the revolt under Bar-Kochebah, were debarred by Adrian from entering Jerusalem, they were wont to assemble annually on the anniversary of the burning of the temple to celebrate this mournful anniversary, and to take a distant look at their beloved Jerusalem. The scene is beautifully described, and with much dramatic feeling, by St. Jerome.—*Com. in Sophoniam*, t. iii. p. 1665.

OLIVETANS, a religious order of the Roman Catholic church, one of the many remarkable products of that well-known spiritual movement which characterized the 12th and 13th centuries. The Olivetans, or brethern of our lady of mount Olivet, are an offshoot of the great Benedictine order (q.v.), and derive their origin from John Tolomei, a native of Sienna, born in the year 1272. Tolomei had been a distinguished professor of philosophy in the university of his native city; but his career was suddenly interrupted by the loss of his sight. Although he was cured of his blindness (and, as he himself believed, miraculously), this visitation convinced him of the vanity of earthly things; and in company with some friends he withdrew to a solitary place near Sienna, where he devoted himself to prayer and religious exercises. By the direction of the pope, John XXII., the new brethren adopted the Benedictine rule; but they chose as their especial province the cultivation of sacred science, and the duty of teaching. In the year 1319 Tolomei was chosen as the first general; and even in his lifetime the institute made rapid progress, especially in Italy. It numbered at one time eighty houses, but at present the number is reduced to four—namely, the parent house, so called, of Monte Oliveto, in the diocese of Arezzo in Tuscany, one at Rome, one at Genoa, and one at Palermo. The Olivetan order has produced many distinguished ecclesiastics.

OLIVINE. See CHRYSOLITE.

OL'LA PODRI'DA (literally, *putrid pot*), a Spanish term, originally signifying an accumulation of remains of flesh, vegetables, etc., thrown together into a pot, but generally employed to designate a favorite national dish of the Spaniards, consisting of a mixture of different kinds of meat and vegetables stewed together. It has also come to be figuratively applied to literary productions of very miscellaneous contents. The French equivalent is *pot-pourri*, and the Scotch *hotch-potch*, both of which, but especially the former, are also employed in a figurative sense.

OLLIVIER, EMILE, b. in Marseilles, 1825, son of Démosthène who was exiled from the time of the *coup d'etat* of Napoleon, in 1851, to 1860. Emile was educated for the practice of law; was made commissary-gen. at Marseilles by Ledru Rollin in 1848, and thereafter prefect. In 1849 he resumed the practice of law in Paris; was elected a liberal member of the legislative assembly from Paris in 1857, and re-elected in 1863. In 1867 he was won over to the Bonapartists, and failed of an election in Paris the following year; but secured a seat by an election as deputy from the department of Var. In December of that year Napoleon made him minister of justice under the new constitution of the empire, which office he entered upon Jan. 2, 1870. He was chiefly noted for his subserviency to the policy of the emperor, and his pretensions to statesmanship. He assumed a supercilious confidence in the French military superiority on the breaking out of the German war in 1870, and retired with his master after the first great reverses to French arms. Through imperial favor he had been made a member of the French academy in 1870, succeeding to the chair of Lamartine. In 1874 he read a eulogy of Napoleon before the academy, and afterward became its chancellor.

OLMSTED, a co. in s.e. Minnesota; drained by the Zumbro and Root rivers and their branches; intersected by the St. Peter and Winona railroad; 650 sq.m.; pop. '80. 21,543—16,862 of American birth. The surface is mostly a rolling prairie, and the soil very productive; wheat, oats, hay, and dairy products are the staples. This is the largest wheat producing county in the state. Co. seat, Rochester.

OLMSTED, DENISON, LL.D., 1791–1859; b. Conn.; graduated at Yale College, 1813, and was tutor 1815–17. He was professor of chemistry in the North Carolina university 1817–25; and from that time till his death was connected with Yale, holding a professorship of mathematics until 1836, and after that, of natural philosophy and astronomy. In 1831 he published a treatise on natural philosophy, and in 1840 one on *School Astronomy*, followed in 1841 by the *Compendium of Astronomy*. These text-books came into almost universal use in the colleges of this country, and in an abridged form, in many public schools. They are still used, though in general supplanted by the more modern works of prof. Loomis and others. Profs. Olmsted and Loomis were the first observers of Halley's comet of 1835. He wrote sketches of the lives of sir Humphrey Davy, Roger Sherman, Eli Whitney, pres. Dwight of Yale, and others, and contributed a very large number of scientific and biographical papers to the *American Journal of Science; New Englander; Journal of Commerce*, and many other periodicals.

OLMSTED, FREDERICK LAW, b. Hartford, Conn., 1822; educated there, and at Yale college, making a specialty of agricultural science and engineering. He began life as a farmer and horticulturist; in 1850 traveled on foot through portions of England, Scotland, and the continent, and published, in 1852, a book of observations under the head of *Walks and Talks of an American Farmer in England*, which was replete with information, and widely read. In 1852–53 he traveled in the cotton states, gathering information which was published in 1856 in a book entitled *A Journey in the Seaboard Slave States*. This was followed by a *Journey Through Texas*, 1857, and *A Journey in the Back Country*, in 1860. Abstracts of these works were issued in two vols. in London in 1861 under the title of *The Cotton Kingdom*. In 1855 he was traveling in France, Italy, and Germany, studying especially their parks and horticultural arts. In 1857, when premiums were offered for the best plans for the Central park in New York, Mr. Olmsted associated himself in the preparation of plans with Mr. Calvert Vaux, partner of A. J. Downing, the distinguished landscape gardener, who was preparing plans for the park when he died. Their combined labors produced the plan which was chosen out of a competition of 34 designs. During the next four years the park was developed under the plans of these gentlemen, in which the most cultivated taste was combined with economy and thoroughness. In 1859 Mr. Olmsted visited Europe to study park works. On the breaking out of the rebellion in 1861 he was appointed by president Lincoln on a commission to investigate the sanitary condition of the U. S. army, and resided for three years in Washington as the business head of the commission. He then spent two years in California, and was made one of the commissioners of the National park of the Yosemite. He returned to New York in 1866 to join Mr. Vaux in the execution of plans for Prospect park in Brooklyn, which they nearly completed under their own supervision. He has since been associated in designs for parks and other public works in Washington, Chicago, San Francisco, Buffalo, and Montreal.

OLMÜTZ, the chief fortress of Moravia, Austria, is the capital of a district of the same name, and is situated in lat. 49° 36′ n., and in long. 17° 15′ e., on an island of the river Moravia, which, by means of sluices, can be opened into the moats, and thus made available for purposes of defense. Olmütz is the see of an archbishop, nominated by the chapter, and is the chief seat of the administrative departments. Its university, founded in 1581, and reorganized in 1827, was reduced to a theological faculty in 1855. Olmütz has a library of 65,000 volumes; good natural history, physical, and other museums; a gymnasium, an archiepiscopal seminary, artillery and infantry academies, polytechnic and other schools, a hospital, an asylum for widows and orphans, etc. The most noteworthy of its churches are the cathedral, a fine old building, and the church of St. Mauritius, completed in 1412, with its celebrated organ, having 48 stops and more than 2,000 pipes. The noble town-hall, with its complicated clock-work, set up in 1574, and the lofty column on the Oberring, with several fine fountains in the squares, and the splendid archiepiscopal palace and chapter-house, all contribute towards the picturesque aspect for which Olmütz is distinguished. The deficiency in public gardens has of late years been in part supplied by the draining and planting of some of the inner moats, and the conversion of some portions of the fortifications into pleasure-grounds. A mile from the city lies the monastery of the Premonstratensians at Hradisch, founded in 1074, now a military hospital. Olmütz has a few manufactories of kerseymere, cloth, linen, and porcelain, and is the seat of an extensive trade in cattle from Poland and Moldavia. Pop. '69, 15,231. Prior to 1777, when Olmütz was raised into an archbishopric, its bishops had long been in the enjoyment of the rank of princes of the empire. The city suffered severely during the thirty years' war, and again in the seven years' war of Silesia, when it more than once fell into the hands of the Prussians. In 1848 Ferdinand I. signed his abdication here in favor of his nephew, Franz-Joseph I.; while in 1850 Olmütz was chosen as the place of conference between the Prussian, Austrian, and Russian plenipotentiaries, for the adjustment of the conflicting differences which had arisen in the German states generally, as the result of the revolutionary movement of 1848.

OLNEY, a t. the co. seat of Richland co., Ill.; on the Grayville and Mattoon, and the Ohio and Mississippi railroads, 130 m. s.e. of Springfield; pop. '70, 2,680. There are a court house, bank, 4 hotels, 2 weekly papers, and many churches and schools. The place was settled in 1845.

OLONETZ′, a government in the n. of Russia, bounded on the w. by Finland, and on the e. and n.e. by Archangel. Area, exclusive of water, 49,104 sq. miles. Pop. '70, 296,392. Large lakes abound in this government, the chief, after lake Onega (q.v.), being lakes Wygo and Sego. The surface is in general elevated, and about four-fifths of it are covered with wood. The soil is sterile, and the climate is cold and damp. The wealth of the government consists principally in its minerals. Its iron mines supply the iron-works of Petrasowodsk, and from its quarries marbles are sent to St. Petersburg. The principal employments of the inhabitants, who are principally Russians and Finns, and belong to the Greek church, are carving in wood, fishing, and hunting. Many of them also are employed in the iron-works and quarries. The women weave and spin. The government derives its name from the small but ancient town of Olonetz. Petrasowodsk is the center of administration.

OLORON, or OLORON-SAINTE-MARIE, a t. of France, in the department of Basses-Pyrénées, on the Gave d'Oloron, 15 m. s.w. of Pau. The church of St. Marie is in the transition style from Romanesque to Gothic. The principal articles of manufacture are the checkered handkerchiefs which form the favorite head-dresses of the peasantry of Aragon and Gascony, and also the "barrets" or caps of the Béarnais. Pop. '76, 7,223.

O′LOT, a t. of Spain, in the province of Gerona, and 22 m. n.w. from Gerona, near the base of the Pyrenees, on the Fluvia. There are 14 volcanic cones close to the town; the crater of the largest is a mile in circumference and 445 ft. in depth. The whole district is volcanic. In many places, and even in the town itself, currents of air blow continually from the porous lava. These are called *bufadores* and *sopladores*, and some of them are conducted beneath houses, and used as refrigerators in hot weather. They maintain the temperature of about 58° F. both in hot and cold weather, but the gust of air is strongest in hot weather. Olot was almost destroyed by an earthquake in 1421, but was soon rebuilt. Pop. 12,070.

OLS'HAUSEN, HERMANN, 1796–1839; b. Oldesloe, in the duchy of Holstein. He studied theology in 1814–18 at Kiel and Berlin, hearing at the former the lectures of Twesten, and at the latter those of Neander and Schleiermacher. His first work was a prize-essay, *Melanchthon's Characteristik aus seinen Briefen dargestellt.* He became in 1818 licentiate in theology in the university; in 1821 was elected professor extraordinary at Königsberg, and in 1827 a regular professor. In 1834 he accepted a theological professorship at Erlangen, where he died at the early age of forty-three. Besides his prize essay he published *Historiæ eccles. veteris monumenta; Die Aechtheit der vier Kanonischen Evangelien aus der Geschichte der zwei ersten Jahrhunderte erwiesen; Ein Wort über tieferen Schriftsinn; Die Bibl. Schriftauslegung; Noch ein Wort über tieferen Schriftsinn.* In this last work he rejects a literal verbal inspiration of the Scriptures. His most valued work is his commentary on the New Testament, translated into English for Clark's foreign theological library, and revised and reprinted with Olshausen's tract on the *Genuineness of the Writings of the New Testament,* by prof. A. C. Kendrick, of Rochester university, 6 volumes.

OLYM'PIA, the scene of the celebrated Olympic games (q.v.), is a beautiful valley in Elis, in the Peloponnesus, through which runs the river Alpheus. As a national sanctuary of the Greeks, Olympia contained, within a small space, many of the choicest treasures of Grecian art belonging to all periods and states, such as temples, monuments, altars, theaters, and multitudes of images, statues, and votive-offerings of brass and marble. In the time of the elder Pliny, there still stood here about 3,000 statues. The Sacred grove (called the *Altis* of Olympia, inclosed a level space about 4,000 ft. long by nearly 2,000 broad, containing both the spot appropriated to the games and the sanctuaries connected with them. It was finely wooded, and in its center stood a clump of sycamores. The Altis was crossed from w. to e. by a road called the "Pompic way," along which all the processions passed. The Alpheus bounded it on the s., the Cladeus, a tributary of the the former, on the w., and rocky but gently swelling hills on the n.; westward it looked towards the Ionian sea. The most celebrated building was the *Olympieium,* or *Olympium,* dedicated to Olympian Zeus. It was designed by the architect Libon of Elis in the 6th c. B.C., but was not completed for more than a century. It contained a colossal statue of the god, the masterpiece of the sculptor Phidias, and many other splendid figures; its paintings were the work of Panænus, a relative of Phidias. Next to the Olympieium ranked the *Heræum,* dedicated to Hera, the wife of Zeus, and the queen of Heaven, containing the table on which were placed the garlands prepared for the victors in the games; the *Pelopium,* the *Metroum,* the ten *Thesauri* or treasuries, built for the reception of the dedicatory offerings of the Greek cities, the temples of Eileithyia and Aphrodite also deserve mention; the *Stadium* and the *Hippodrome,* where the contests took place, stood at the eastern end of the Altis. The plowshare now passes through the scene of these contests, but many ruins still attest the ancient magnificence of the buildings. In 1875 explorations, at the expense of the German government, were undertaken at Olympia, and already several important "finds" have been made.

OLYMPIA, the capital city of Washington territory, on Budd's inlet, at the s. part of Puget sound, about 100 m. n by w. of Portland, Oregon, in lat. 47° 10' n., long. 123° w.; pop. '75, 1500. The Des Chutes river, which enters the sound at this point, is spanned by a bridge 520 ft. long from Olympia to Tumwater, and there is a bridge over 2,000 ft. long across the inlet. The nearest railroad station is Tenino, 15 m. s., on the Northern Pacific railroad. The surrounding country is covered with forests, and lies between the Coast and Cascade mountains. The streets are wide and regularly laid out, bordered with shade trees, and lined with handsome residences, many of which are inclosed by gardens. Among the public buildings are the state-house, court-house, and city hall. There are 4 hotels, 7 churches, a bank, an academy, and 2 libraries. There are 3 weekly newspapers. Boots and shoes, flour, soap, beer, and lumber are manufactured. The Des Chutes furnishes ample water-power. Steamers run almost daily to Victoria and other points on Puget sound, and a line of stages to the railroad station at Tenino. Large vessels can come up the inlet to Olympia at high tide; but low tide uncovers a long mud flat which prevents even small boats from reaching the wharf. The difference between extreme high and low tides here is 24 ft., and the average ebb and flow 9.2 feet. Olympia was surveyed in 1851; made a city, 1859.

OLYMPIAD (Gr. *olympias*), the name given to the period of four years that elapsed between two successive celebrations of the Olympic games (q.v.); a mode of reckoning which forms the most celebrated chronological era among the Greeks. The first recorded dates from July 21 or 22, 776 B.C., and is frequently referred to as the Olympiad of Corœbus; for historians, instead of referring to the olympiad by its number, frequently designate it by the name of the winner of the foot-race in the Olympic games belonging to that period, though at times both the number and the name of the conqueror are given A slight indefiniteness is frequently introduced into Greek chronology, from the custom of mentioning only the olympiad, neglecting to specify in which year of the olympiad a certain event happened. As this era commenced in 776 B.C., the first year of our present era (1 A.D.) corresponded to the last half of the fourth year of the 194th with the first half of the first year of the 195th olympiad, and 394 A.D. corresponds to the second year of the 293d olympiad, at which time reckoning by olympiads terminated. This era is used only by writers, and is never found on coins, and very seldom on inscriptions. Another olympic era, known as the "New Olympic Era," was commenced by the Roman emperors, and dates from 131 A.D.; it is found both in writings, public documents, and inscriptions.

OLYMPIAS, the wife of Philip II., king of Macedon, and mother of Alexander the great. She was the daughter of Neoptolemus I., king of Epirus. She possessed a vigorous understanding, but was of a most passionate, jealous, and ambitious character. Philip having, on account of disagreements, separated from her and married Cleopatra, niece of Attalus (337 B.C.), she went to reside with her brother Alexander, king of Epirus, where she incessantly fomented intrigues against her former husband, and is believed to have taken part in his assassination by Pausanias, 337 B.C. On the accession of her son Alexander to the throne, she returned to Macedonia, where she contributed to bring about the murder of Cleopatra and her daughter. Alexander was filled with indignation, but Olympias was his mother, and he could not obey the dictates of justice. During his brief but magnificent career he always treated her with the utmost reverence and esteem, though he never allowed her to meddle with his political schemes. After his death she endeavored to get possession of the vacant throne, and obtained the support of Polysperchon in her designs. In 317 the two defeated Arrhidæus, the weak-minded step-brother and successor of Alexander, and his wife Eurydice, whom she caused to be put to death in the same year. She now began to glut her revenge on such of the Macedonian nobles as had shown themselves hostile to her; but her cruelties soon alienated the minds of the people from her, even though she was the mother of their heroic king, whereupon Cassander (q.v.), her principal adversary, marched n. from the Peloponnesus, besieged her in Pydna, and forced her to surrender in the spring of 316 B.C. She was immediately afterward put to death. Olympias was a woman of heroic spirit, but of fierce and uncontrollable passions, and in the perpetration of crime, when she reckoned it necessary, displayed an unscrupulousness peculiarly feminine.

OLYMPIC GAMES, the most splendid national festival of the ancient Greeks, were celebrated every fifth year in honor of Zeus, the father of the gods, on the plain of Olympia (q.v.). Their origin goes back into prehistoric ages. According to the myth elaborated or preserved by the Elean priests, they were instituted by the Idæan Herakles in the time of Kronos, father of Zeus; according to others, by the later Herakles, son of Zeus and Alkmene; while Strabo, rejecting the older and more incredible legends, attributes their origin to the Herakleidæ after their conquest of the Peloponnesus. But the first glimpse of anything approaching to historic fact in connection with the games is their so-called revival by Iphitos, king of Elis, with the assistance of the Spartan lawgiver, Lycurgus, about 884 B.C.; or, according to others, about 828 B.C., an event commemorated by an inscription on a disk kept in the *Heræum* at Olympia, which Pausanias (flor. 2d c. A.D.) saw. That festive games were celebrated here—in other words, that Olympia was a sacred spot long before the time of Iphitos, can indeed hardly be doubted: the universal tradition that the Elean king had only "revived" the games proves this; but nothing whatever can be historically ascertained concerning their origin, character, or frequency, in this remoter time. Iphitos may, therefore, be regarded as their founder, yet the reckoning of time by olympiads (q.v.)—the real dawn of the historical period in Greek history—did not begin till more than a century later. At first, it is conjectured, only Peloponnesians resorted to the Olympic games, but gradually the other Greek states were attracted to them, and the festival became *Panhellenic*. Originally, and for a long time, none were allowed to contend except those of pure Hellenic blood; but after the conquest of Greece by the Romans, the latter sought and obtained this honor, and both Tiberius and Nero figure in the list of Roman victors. Women—with one exception, the priestess of Demeter Chamyne—were forbidden to be present, on pain of being thrown headlong from the Typæan rock. The games were held from the 11th to the 15th of the Attic month *Hekatombaeon* (our July–August), during which, first throughout Elis, and then throughout the rest of Greece, heralds proclaimed the cessation of all intestine hostilities; while the territory of Elis itself was declared inviolable. The combatants were required to undergo a preparatory training for 10 months in the gymnasium at Elis, and during the last of these months the gymnasium was almost as numerously attended as the games themselves. Much uncertainty prevails as to the manner in which the contests were distributed over the different days. Krause (*Olympia*, p. 106) suggests the following order: On the first day the great initiatory sacrifices were offered, after which the competitors were properly classed and arranged by the judges, and the contests of the trumpeters took place; the second day was set apart for the boys who competed with each other in foot-races, wrestling, boxing, the *pentathlon*, the *pankration*, horse-races; the third and principal day was devoted to the contests of men in foot-races of different kinds (as, for example, the simple race, once over the course; the *diaulos*, in which the competitors had to run the distance twice; and the *dolichos*, in which they had to run it seven or twelve times); wrestling, boxing, the *pankration* (in which all the powers and skill of the combatants were exhibited), and the race of *hoplites*, or men in heavy armor; on the fourth day came off the *pentathlon* (contest of five games —viz., leaping, running, throwing the discus, throwing the spear, and wrestling), the chariot and horse races, and perhaps the contests of the heralds; the fifth day was set apart for processions, sacrifices, and banquets to the victors (called *Olympionikoi*), who were crowned with a garland of wild olive twigs cut from a sacred tree which grew in the Altis (see OLYMPIA), and presented to the assembled people, each with a palm branch in his hand, while the heralds proclaimed his name, and that of his father and country. On his return home, he was received with extraordinary distinction; songs were sung in his praise (14 of Pindar's extant lyrics are devoted to *Olympionikoi*); statues were erected to him, both in the Altis and in his native city; a place of honor was given him at all public spectacles; he was in general exempted from public taxes, and at Athens was boarded at the expense of the state in the Prytaneion.

The regulation of the games belonged to the Eleans, from whom were chosen the *hellanodikai*, or judges, whose number varied. At first there were only two, but as the games became more and more national, and consequently more numerous, they were gradually increased to ten, sometimes even to twelve. They were instructed in their duties for ten months beforehand at Elis, and held their office only for one year. The officers who executed their commands were called *alytia*, and were under the presidency of an alytarch.—See Crause's *Olympia oder Darstellung der grossen Olympischen spiele* (Wien, 1838.)

OLYMPIODO'RUS, one of the latest of the Alexandrian Neoplatonists, flourished in the first half of the 6th c. after Christ, during the reign of the emperor Justinian. Regarding his life nothing is known. Of his writings, we possess a *Life of Plato*, with commentaries or scholia on several of his dialogues, the Gorgias, Philebus, Phædo, and Alcibiades I. In these he appears as an acute and vigorous thinker, and as a man of great erudition. Olympiodorus's *Life of Plato* was published by Wetstein (1692), Etwall (Lond. 1771), and Fischer (Leips. 1788); the best edition of the scholia is that of Mystoxides and Schinas (Venice, 1816).

OLYMPUS, the ancient name of several mountains or chains of mountains—*e.g.*, of the north-western continuation of Taurus in Mysia, of a mountain in the island of Cyprus, of one in Lycia, of another in Elis, of one on the borders of Laconia and Arcadia, and of another on the frontiers of Thessaly and Macedonia. Of these, the last-mentioned (now called *Elymbo*) is the most famous. Its eastern side, which fronts the sea, is composed of a line of vast precipices, cleft by ravines, filled with forest-trees. Oak, chestnut, beech, plane tree, are scattered abundantly along its base, and higher up appear great forests of pine, as in the days of the old poets of Greece and Rome. With Euripides, it is *poludendros Olympos;* with Virgil, *frondosus Olympus;* and with Horace, *opacus Olympus.* Its highest peak is 9,754 ft. above the level of the sea, and is covered with snow for about nine months of the year. It was regarded by the ancient Greeks as the chief abode of the gods, and the palace of Zeus was supposed to be upon its broad summit. According to Greek legend, it was formerly connected with Ossa, but was separated from it by an earthquake, allowing a passage for the Peneius through the narrow vale of Tempe to the sea. The philosophers afterwards transferred the abode of the gods to the planetary spheres, to which they likewise transferred the name of Olympus.

OLYNTHUS, an ancient city of Macedonia, situated on the Toronäic gulf. It was probably founded by the Eubœan Etrurians and Chalcidians. At the time of the second Persian invasion the town was captured and sacked by Artabazus, one of Xerxes's generals. When Brasidas overthrew the Athenian power in Chalcidice, Olynthus gradually gained importance and became the head of an alliance among the northern Greek states, which soon provoked the jealousy of Athens and Lacedæmonia. When the annexation of Appollonia and Acanthus was threatened by Olynthus, 383 B.C., an army of 10,000 men was sent against that republic by the Peloponnesian states, under the command of Teleutias, a Spartan. The Olynthians were driven back into their city; but, in a sortie, surprised the enemy and threw them into a panic. Teleutias being killed while trying to rally his forces. Agesipolis then took command, and had gained the advantage, when he died, and Polybiades, his successor, compelled the surrender of the city in 379 B.C. The confederation was broken up. For some time they had an alliance with Philip of Macedonia; but, two years after they had completed a league with Athens, 352 B.C., war broke out between Olynthus and Macedonia. It was in advocacy of the policy of supporting the Olynthians that Demosthenes uttered the Olynthiacs, among the best of his orations. Some aid was sent by Athens, but it was totally inadequate, and in 347 B.C. Philip razed the city to the ground and sold the inhabitants as slaves.

OM is a Sanskrit word which, on account of the mystical notions that even at an early date of Hindu civilization were connected with it, acquired much importance in the development of Hindu religion. Its original sense is that of emphatic or solemn affirmation or assent. Thus, when in the White-Yajur-Veda (see VEDA) the sacrificer invites the gods to rejoice in his sacrifice, the god Savitr'i assents to his summons by saying: "*Om* (i.e., be it so); proceed!" Or, when in the Br'had-âranyaka-Upanishad, Prajâpati, the father of gods, men, and demons, asks the gods whether they have understood his instruction; he expresses his satisfaction with their affirmative reply, in these words: "*Om*, you have fully comprehended it;" and, in the same Upanishad, Pravâhan'a answers the question of S'wetaketu, as to whether his father has instructed him, by uttering the word "*Om*," i.e., "forsooth (I am)." A portion of the R'igveda, called the Aitareya-Brâhman'a, where describing a religious ceremony at which verses from the R'igveda, as well as songs called Gâthâs, were recited by the priest called Hotr'i, and responses given by another priest, the Adhwaryu, says: "*Om* is the response of the Adhwaryu to the R'igveda verses (recited by the Hotr'i), and likewise *tathâ* (i.e., thus) his response to the Gâthâs, for *Om* is (the term of assent) used by the gods, whereas *tathâ* is (the term of assent) used by men" (the R'igveda verses being, to the orthodox Hindu, of divine, and the Gâthâs of human, authorship). In this, the original sense of the word, it is little doubtful that *om* is but an older and contracted form of the common Sanskrit word *evam*, "thus," which, coming from the pronominal base "*a*"—in some derivations changed to "*é*"—may have at one time occurred in the form *avam*, when, by the elision of the vowel following *v*—for which their are numerous analogies in Sanskrit—*avam* would become *aum*, and hence, according to the ordinary phonetic laws of the language, *om*. This etymology of the word, however, seems to have been lost, even at an early period of Sanskrit literature; for another is met with in the ancient grammarians, enabling us to account for the mysticism which many religious and theological works of ancient and mediæval India suppose to inhere in it. According to this latter etymology, *om* would come from a radical *av* by means of an affix *man*, when *om* would be a curtailed form of *avman* or *oman;* and as *av* implies the notion of "protect, preserve, save," *om* would be a term implying "protection or salvation;" its mystical properties and its sanctity being inferred from its occurrence in the Vedic writings, and in connection with sacrificial acts, such as are alluded to before.

Hence *Om* became the auspicious word with which the spiritual teacher had to begin, and the pupil had to end each lesson of his reading of the Veda. "Let this syllable," the existing Prâtis'âkhya, or grammar of the R'igveda, enjoins, "be the head of the reading of the Veda, for, alike to the teacher and the pupil, it is the supreme Brahman, the gate of heaven." And Manu (q.v.) ordains: "A Brahman, at the beginning and end (of a lesson on the Veda), must always pronounce the syllable *Om;* for unless *Om* precede, his learning will slip away from him; and unless it follow, nothing will be long retained." At the time when another class of writings, the Purân'as (q.v.), were added to the inspired code of Hinduism, for a similar reason, *Om* is *their* introductory word.

That the mysterious power which, as the foregoing quotation from the law-book of Manu shows, was attributed to this word, must have been the subject of early speculation, is obvious enough. A reason assigned for it is given by Manu himself. "Brahmâ," he says, "extracted from the three Vedas the letter *a*, the letter *u*, and the letter *m* (which combined result in *Om*), together with the (mysterious) words *Bhûh'* (earth), *Bhuvah'* (sky), and *Swah'* (heaven);" and in another verse: "These three great immutable words, preceded by the syllable *Om*, and (the sacred R'igveda verse, called) Gâyatri, consisting of three lines, must be considered as the mouth (or entrance) of Brahman (the Veda)"—or, as the commentators observe—the means of attaining final emancipation; and "The syllable *Om* is the supreme Brahman, (three) regulated breathings (accompanied with the mental recitation of Om, the three mysterious words, Bhûh', Bhuvah', Swah', and the Gâyatri), are the highest devotion. . . . . All rites ordained in the Veda, such as burnt and other sacrifices, pass away; but the syllable *Om* must be considered as imperishable, for it is (a symbol of) Brahman (the supreme Spirit) himself, the Lord of Creation." In these speculations, Manu bears out, and is borne out by, several Upanishads. See VEDA. In the *Katha-Upanishad*, for instance, *Yama*, the god of death, in replying to a question of Nachiketas, says: "The word which all the Vedas record, which all the modes of penance proclaim, of which desirous the religious students perform their duties, this word I will briefly tell thee, it is *Om*. This syllable means the (inferior) Brahman and the supreme (Brahman). Whoever knows this syllable, obtains whatever he wishes." And in the *Pras'na-Upanishad*, the saint Pippalâda says to Satyakâma: "The supreme and the inferior Brahman are both the word *Om;* hence the wise follows by this support the one or the other of the two. If he meditates upon its one letter (*a*) only, he is quickly born on the earth; him carry the verses of the R'igveda to the world of man; and if he is devoted there to austerity, the duties of a religious student, and faith, he enjoys greatness. But, if he meditates in his mind on its two letters (*a* and *u*), he is elevated by the verses of the Yajur-Veda to the intermediate region; he comes to the world of the moon, and having enjoyed there power, returns again (to the world of man). If, however, he meditates on the supreme Spirit by means of its three letters (*a*, *u*, and *m*), he is produced in light, in the sun; as the snake is liberated from its skin, so he is liberated from sin." According to the Mân'd'ûkya-Unpanishad, the nature of the soul is summarized in the three letters *a*, *u*, and *m*, in their isolated and combined form—*a* being Vais'wânara, or that form of Brahman which represents the soul in its waking condition; *u*, Taijasa, or that form of Brahman which represents the soul in its dreaming state; and *m*, Prâjna, or that form of Brahman which represents it in its state of profound sleep (or that state in which it is temporarily united with the supreme Spirit); while *a*, *u*, *m*, combined, i.e., Om, represent the fourth or highest condition of Brahman, "which is unaccountable, in which all manifestations have ceased, which is blissful and without duality. *Om*, therefore is soul; and by this soul, he who knows it enters into (the supreme) soul." Passages like these may be considered as the key to the more enigmatic expressions used, for instance, by the author of the *Yoga* (q.v.) philosophy, where, in three short sentences, he says: "His (the supreme Lord's name) is *Pran'ava* (i.e., *Om*): its muttering (should be made) and reflection on its signification; thence comes the knowledge of the transcendental spirit and the absence of the obstacles" (such as sickness, languor, doubt, etc., which obstruct the mind of an ascetic). But they indicate, at the same time, the further course which superstition took in enlarging upon the mysticism of the doctrine of the Upanishads. For as soon as every letter of which the word *Om* consists was fancied to embody a separate idea, it is intelligible that other sectarian explanations were grafted on them, to serve their special purposes. Thus while S'ankara, the great theologian and commentator on the Upanishads, is still contented with an etymological punning, by means of which he transforms "*a*" (or rather "*â*") into an abbreviation of *âpti* (pervading), since speech is pervaded by Vais'wânara; "*u*" into an abbreviation of *utkarsha* (superiority), since Taijasa is superior to Vais'wânara; and "*m*" into an abbreviation of *miti* (destruction), Vais'wânara and Taijasa, at the destruction and regeneration of the world, being, as it were absorbed into Prâjna—the Purân'as (q.v.) make of "*a*" a name of Vishn'u; of "*u*," a name of his consort *S'ri;* and of "*m*," a designation of their joint-worshipper; or they see in *a*, *u*, *m*, the Triad, Brahmâ, Vishn'u, and S'iva; the first being represented by "*a*," the second by "*u*," and the third by "*m*"—each sect, of course, identifying the combination of these letters, or Om, with their supreme deity. Thus, also, in the Bhagavadgîrâ, which is devoted to the worship of Vishn'u in his incarnation as Kr'ishn'a, though it is essentially a poem of philosophical tendencies, based on the doctrine of the Yoga, Kr'ishn'a in one passage says of himself that he is *Om;* while, in another passage, he qualifies the latter as the supreme Spirit.—A common designation of the word *Om*—for instance, in the last named passages of the Bhagavadgîtâ—is the word *Pran'ava*, which comes from a so-called radical *nu*, "praise," with the prefix *pra*, amongst other meanings, implying emphasis, and therefore literally means "eulogium, emphatic praise." Although *Om*, in its original sense, as a word of solemn or emphatic assent, is, properly speaking, restricted to the Vedic literature, it deserves notice that it is nowadays often used by the natives of India in the sense of "yes," without, of course, any allusion to the mystical properties which are ascribed to it in the religious works. See also the article Om Man'i Padme Hûm'.

That there exists no connection whatever, as has been supposed by some writers to be the case, between *Om* and *Amen*, requires scarcely any remark, after the etymological explanations given above; but it may not be without interest to observe that, though the derivation of *Om*, as a curtailment of *av-man*, from *av*, "protect, save," is probably merely artificial, and, as stated before, invented to explain the later mystical use of the Vedic word, it seems more satisfactory to compare the Latin *omen* with a Sanskrit *avman*, "protection," as derived by the grammarians from *ăv* (in the Latin *ăve-o*), than to explain it in the fashion of the Roman etymologists: "Omen, quod ex ore primum elatum est, osmen dictum;" or, "Omen velut oremen, quod fit ore augurium, quod non avibus aliove modo fit." And since *pra-nava*, from Sanskrit *nu*, "praise," is, like *Om*, used in the sense of "the Deity," it is likewise probable that *numen* does not come, as is generally believed, from Latin *nu-(ere)*, "nod," but from a radical corresponding with the Sanskrit *nu*, "praise."

OMAGH (Irish, *Oigh magh*, "Seat of the chiefs"), an ancient t., capital of the co. of Tyrone in Ireland, situated on the river Strule, distant 34 m. s. from Londonderry, and 110 m. n.n.w. from Dublin, with both which cities it is connected by railway. Omagh grew up around an abbey founded in the year 792, but is first heard of as a fortress of Art O'Nial in the end of the 15th c., about which time it was forced to surrender to the English, although its possession long continued to alternate between Irish and English hands. It formed part of James I.'s "Plantation" grants, and was strongly garrisoned by Mountjoy. On its being evacuated by the troops of James II. in 1689, it was partially burned, and a second fire in 1743 completed its destruction. But has it been well rebuilt, and is now a neat and prosperous town. Pop. '71, 3,724. Omagh contains a very handsome court-house, where the assizes for county Tyrone are held, several neat churches (Roman Catholic, Episcopal, and Presbyterian), a convent, several partially endowed and national schools, a district lunatic asylum, and the work-house of the Poor-Law Union of which it is the center. There is also a barrack station—it being within the Belfast military district. Its trade is chiefly in brown linens, corn, and agricultural produce.

O'MAHA, the chief city of the state of Nebraska, is on the right bank of the Missouri, opposite Council Bluffs, and 20 m. n. of the mouth of the Nebraska river. Besides the government offices, it has a large trade by the rivers, and across the prairies, and is the eastern terminus of the Union Pacific railway, and also of the Omaha and North-western, and the Omaha and South-western lines. Pop. in 1860, 1912; in 1870, 16,083.

O'MAHA (*ante*), the chief city of Nebraska, though not its capital, on the w. bank of the Missouri river, lat. 41° 80' n. and long. 96° w. of Greenwich. Its site is upon a hilly plateau from 50 to 150 ft. above the river, and 950 ft. above the level of the sea, with planes fairly adapted to city improvements. Its name is derived from one of the tribes of Dakota Indians. The t. was laid out in 1854, became an incorporated city in 1859, and was platted on a scale of magnitude that anticipated the growth of a great city. The territorial capital was first located here, but was subsequently fixed at the city of

Lincoln. It is the county seat of Douglass county. Omaha is 490 m. westerly by rail from Chicago; pop. '60, 1883; '70, 16,083; '80, 30,518. Before the construction of the Union Pacific road, which began at this point, it was the most northerly outfitting place for overland trains to the "far west."

The aid of the government in the construction of the Union Pacific railway, and the choice of Omaha as its starting point on the Missouri in 1864, made it the theater of great speculation in the belief that it was destined to an extraordinary growth. Its growth has in fact been rapid, though less so than was anticipated by some enthusiasts. It now has connections by the Union bridge across the Missouri, connecting it with the city of Council Bluffs on the e. side, with a great radiating system of railways to all points eastward, and with the country to the n., w., and s., by other roads of which it is the terminus.

The city is lighted with gas, has several street railway lines, a U.S. court-house and post office, which is the finest building in the city, and in which the U.S. court for the district of Nebraska sits; large and excellent school buildings, extensive railway structures, hotels, the state institution for the deaf and dumb, and many elegant residences and business houses. Its wholesale trade in 1875 amounted to $9,500,000. It then had a banking capital of $600,000, with bank deposits to the amount of $2,700,000. It has extensive iron works for making and rolling railroad iron, machine shops, and one of the most complete establishments in the country for smelting, separating, and refining the ores of gold, silver, copper, lead, and zinc; which come to Omaha to be treated from the mining regions of all the territories along the line of the Union Pacific and Central Pacific railways. The city has 8 daily and 6 weekly newspapers, 8 monthlies, and 24 churches.

OMAHAS, an Indian tribe of the Dakota family, living when visited by the early explorers along the St. Peter's river, divided into two tribes, Ishtasundas and Hongashanos, and 13 clans, one of which had charge of a sacred shell, kept in a temple. One of their customs forbade a man's speaking with his father-in-law or mother-in-law. They could, at one time, muster 700, but in 1802 small-pox had reduced their number to 300. They now left their settlements and for some years led a roving life, constantly harassed by the Sioux. The explorers Lewis and Clarke found them in 1805 living along the Quicoure river. Their number was then 600. Between 1815 and 1854, they ceded large portions of their lands. Missions were established among them in 1839, and again in 1846, but met with little success. They had succeeded in making a permanent treaty of peace with the Poncas and Pawnees in 1800, but were continually at war with the Sioux, who several times forced them to withdraw to the Elkhorn. In 1843 they negotiated a treaty of peace with some of the Sioux, and went back to their old settlements. The most famous of their chiefs, Logan Fontanelle, was slain by the Sioux in 1855. For the last generation they have followed agriculture, and have been more prosperous; and their number has increased to about 1000. They have established schools and a church, and hold property valued at $75,000. They live on an extensive reservation in Blackbird co., Nebraska.

OMAN', the most eastern portion of Arabia, a strip of maritime territory, extending between Ras-el-Jiboul and Ras-el-Had, bounded on the n.e. by the gulf of Oman, and on the s.w. by the deserts of the interior. It is about 370 m. in length; its greatest breadth is 120 miles. At a distance of from 20 to 40 m. from the coast, a chain of mountains runs parallel to it, which reaches in its highest ridge, called *Gebel Achdar* ("Great Mountain"), an elevation of 6,000 ft.; the average height is 4,000 feet. There are a few not inconsiderable streams, and some richly fertile tracts in this region, but the greater part is a waste of sand, with here and there a small oasis, where, however, the vegetation is most luxuriant. Groves of almond, fig, and walnut-trees, tower to an enormous height, overshadowing the orange and citron trees, but are themselves overtopped by the splendid date-palms. The most powerful state of Oman is *Muscat* (q.v.).

OMAR, ABÛ-HAFSA-IBN-AL-KHETTAB, the second caliph of the Moslems, was b. about 581. His early history is little known, but previous to his conversion he was an ardent persecutor of Mohammed and his followers. After his conversion he became as zealous an apostle as he had formerly been a persecutor, and rendered valuable aid to the prophet in all his warlike expeditions. After Mohammed's death, he casused Abu-bekr to be proclaimed caliph, and was himself appointed *haujeb*, or prime-minister. Though of a fiery and enthusiastic temperament, he proved a sagacious adviser, and it was at his suggestion that the caliph put down with an iron hand the many dissensions which had arisen among the Arabs after the prophet's decease, and resolved to strengthen and consolidate their new-born national spirit, as well as propagate the doctrines of Islam, by engaging them in continual aggressive wars. On the death of Abu-bekr, Omar, succeeded as caliph, and pushed on the wars of conquest with increased vigor. He was summoned to Jerusalem in 637, to receive the keys of that city, and before leaving gave orders to build a mosque, now called by his name, on the site of the temple of Solomon. Omar now took the command of a portion of the army, and reduced the other chief cities of Palestine. He then planned an invasion of Persia, which was commenced the same year, and by 642 the whole of what is now known as Persia was subdued. In the meantime the war in Syria was vigorously prosecuted, and the Byzantine armies, repeatedly defeated, at length gave up the contest. In 639, Amrû, one of his generals, had invaded Egypt with a considerable force; but such was the prestige of the Arabs, or the incapacity of the lieutenants of the emperor Heraclius, that this valuable country, with its six millions of people, was reduced under the caliph's authority without a single contest, and only two towns, Misr and Alexandria, were even attempted to be defended. (For the story which was till lately believed concerning the destruction of the Alexandrian library, see ALEXANDRIAN LIBRARY.) Barca and Tripoli were next subdued by Amrû. On the n., Armenia was overrun in 641, and the caliph's authority now reached from the desert of Khiva to the Syrtis, an enormous extension in ten years. In 644 Omar was assassinated in the mosque of Medina by a Persian slave from motives of revenge. He languished five days after receiving the wound, but refused to appoint a successor, and named six commissioners who were to choose one from themselves. He was buried in the mosque of Medina, near the prophet and Abu-bekr, and his tomb is still visited by pilgrims.

Omar may be called the founder of the Mohammedan power, as from a mere sect he raised it to the rank of a conquering nation, and left to his successor an empire which Alexander the great might have envied. In him we find a rare combination of qualities, the ardent zeal of the apostle side by side with the cautious foresight and calm resolution of the monarch. His great military talents, and severity to "obstinate unbelievers," rendered him formidable to his enemies, and his inexorable justice rendered him no less obnoxious to the more powerful of his subjects, and gave rise to many attempts at his assassination. Omar was the founder of many excellent institution; he assigned a regular pay to his soldiers, established a night-police in towns, and made some excellent regulations for the more lenient treatment of slaves. He also originated the practice of dating from the era of the *Hedjrah* (q.v.). He assumed the title of *Emir-al-mumenin* ("Commander of the Faithful") in preference to that of *Khalifah-rasouli-llahi*, the ordinary designation; and to the present day his name is held in the greatest veneration by the orthodox or Sunî sect of Moslems.

OMAR PASHA, a celebrated Turkish general, was b. at Plaski, an Austrian village in the Croatian military frontier, in 1806 (according to some authorities, in 1811). His real name was Mikail Lattas, and his father being an officer in the Austrian army, Mikail was educated at the military school of Thurn, near Carlstadt, where he greatly distinguished himself. He afterward joined one of the frontier regiments as a cadet, and was employed as secretary by the military inspector of roads and bridges; but having by some breach of discipline rendered himself amenable to punishment, he fled to Bosnia, where he became book-keeper to a Turkish merchant, and embraced Mohammedanism. He was next employed by Hussein Pasha, the governor of Widin, as tutor to his sons; and in 1834 was sent in charge of them to Constantinople, where his beautiful calligraphy gained for him the post of writing-master in the military school. Omar Effendi (as he was now called) was next appointed writing-master to Abdul-Medjid, the heir to the throne, and received the honorary rank of capt. in the Turkish army, and the hand of a rich heiress. On his pupil's accession in 1839, Omar was raised to the rank of col., and sent to Syria to aid in the suppression of disturbances which had broken out in that province, and in 1842 he was appointed military governor of the Lebanon district. The severity of his rule did not hinder the Maronites from desiring to have him as chief of the mountain; but in the following year he was recalled, received the title of pasha, and was sent, along with Redschid Pasha, against the revolted Albanians. The skill and energy with which he suppressed this insurrection, as well as others in Bosnia and Kurdistan, raised him high in favor with the sultan. Toward the end of 1852 he opened the campaign against the Montenegrins, who were being rapidly subdued, when Austria interfered and compelled a treaty. On the invasion of the principalities by the Russians (July 1853), Omar collected at Schumla an army of 60,000 men to cover Constantinople; but being no less a politician than a soldier, he soon divined that the Russians would not immediately cross the Danube, and accordingly pushed on to Widin, where he crossed the river in presence of the enemy and intrenched himself at Kalafat. Another part of the Turkish army moved down the Danube to Turtukai, near Silistria, crossed the river at that place, and intrenched themselves at Oltenitza. On Nov. 4, the latter division were attacked by 9,000 Russians, whom they totally defeated with a loss of nearly 4,000 men and almost all their officers. The Russians also received two severe checks at Kalafat, on Jan. 6, and March 15, 1855. Omar kept up the spirit of his troops by occasional successful skirmishes with the Russians, and threw a garrison of 8,000 men into Silistria. In the following spring the Russians passed the Danube at two points, and laid siege to Silistria (q.v.), but their assaults were invariably repulsed with severe loss. The Russians then withdrew from the principalities, and Omar entered Bucharest in triumph in August, 1854. On Feb. 9, 1855, he embarked for Eupatoria, where, on the 17th of the same month, he was suddenly attacked by 40,000 Russians, who were repulsed with great loss. He was soon afterward (Oct. 3, 1855) sent to relieve Kars, but arrived too late, and the armistice which followed (Feb. 29, 1856) put a stop to his military career. He was subsequently made governor of Bagdad; but having been accused of maladministration, was banished to Kaarport in 1859. He was recalled in the following year, and in September, 1861, was sent to pacify Bosnia and Herzegovina, which were again in insurrection. This being accomplished, he attacked the Montenegrins, captured their chief town of Cetinji, and overran the country in 1862. Omar held the grand cross of the legion of honor, and was a knight of the Russian order of St. Anne. He ceased to take part in public life in 1869, being thereafter regarded as a minister without portfolio; and died in 1871.

OMBAY', or MALOEWA (Maluwa), an island between Celebes and the n.w. coast of Australia, lies to the n. of Timor, from which it is separated by the strait of Ombay, lat. 8° 8' to 8° 28' s., long. 124° 17' to 125° 7' east. Area, 961 sq.miles. The pop. amounts to about 193,800. The hills of Ombay are volcanic, and the coasts steep and difficult to approach. The inhabitants are dark brown, have thick lips, flat nose, and woolly hair; appearing to be of mixed negro and Malay origin. They are armed with the bow, spear, and creese, and live on the produce of the chase, with fish, cocoa-nuts, rice, and honey. A portion of the island formerly belonged to the Portuguese, but since Aug. 6, 1851, it is entirely a Netherlands possession. The Dutch post-holder resides at the village of Alor, to which iron wares, cotton goods, etc., are brought from Timor, and exchanged for wax, edible nests, provisions, and other native products. Ombay has oxen, swine, goats, etc., and produces maize, cotton, and pepper. Amber is also found, and the Boeginese of Celebes import European and Indian fabrics, exchanging them for the produce of the island, which they carry to Singapore.

O'MEARA, BARRY EDWARD, was b. in Ireland in the year 1786. Otherwise without claim to be remembered, his name remains notable from his connection with the first Napoleon, whom he accompanied to St. Helena as household physician. At the age of 18 he entered the British army as assistant-surgeon. In 1808, being stationed at Messina, he became concerned in a duel as second, under circumstances which must more or less have been held discreditable, as his dismissal from the service by sentence of court-martial was the result. Afterward he succeeded in procuring an appointment as surgeon in the navy, and as such for some years is certified to have discharged his duties with zeal and efficiency. As it chanced, he was serving with capt. Maitland in the Bellerophon, when the emperor Napoleon (q.v.) surrendered himself to that officer. During the voyage from Rochefort to Plymouth he was introduced to Napoleon, on whom the impression he produced was favorable, leading to a proposal that he should accompany the emperor into exile as private physician, an arrangement to which he acceded, stipulating that he should retain his rank in the navy, and be permitted to return to it at pleasure. By Napoleon, with whom he remained in daily intercourse at St. Helena for about three years, he seems to have been admitted to something more or less like intimacy; and occasionally it might well be, as he says, that the great captive would kill the creeping hours by loose talk with his attendant over the events of his strange life. Of these conversations O'Meara naturally enough took notes, which he afterward published. Meantime he became involved in the interest of Napoleon, in the series of miserable and petty squabbles which he waged with the governor, sir Hudson Lowe (q.v.). The result of these, as regards O'Meara, was that in 1818, after a violent altercation with sir Hudson, he was committed to close arrest, and was authorized by the emperor to resign his post. On his return to England, he addressed a letter to the admiralty, in which, among other things, he accused sir Hudson Lowe of intentions against the life of his captive, and even of having, by dark hints to himself, insinuated a desire for his services as secret assassin. For this he was instantly dismissed the service. The accusation was plainly monstrous and incredible. In 1822, after Napoleon's death, O'Meara published *Napoleon in Exile*, by which book alone he is now remembered. As conveying to the world the first authentic details of the prison-life of the great diseased, it made on its appearance an immense sensation, and— though for obvious reasons everywhere to be accepted, if at all, with caution—it is still not utterly without interest. The last years of O'Meara's life were passed in obscurity in the neighborhood of London, where, in 1836, he died.

OMELET, or OMELETTE, French, a dish chiefly composed of eggs. These are broken, and their contents put into a proper vessel, in which they are whipped into a froth, which is poured into a very clean and dry frying-pan, with the addition of lard or butter to prevent sticking, and then fried carefully, so that the outside is nicely browned. Before frying, one of a number of ingredients may be added to vary the omelet, such as chopped savory herbs, minced ham or bacon, salt-fish, shell-fish, game, etc. Or sweet omelets may be made by placing preserved fruits upon them when quite or nearly cooked. The omelet is an excellent dish, and, simple though it be, it requires much skill to prepare it successfully.

O'MEN (for the deriv., see OM), or PRODIGY (generally said to be from *pro* and *dico*, but more probably from *pro* and *ago*, to lead; hence anything conspicuous, or *extra*ordinary), the name given by the Romans to signs by which approaching good or bad fortune was supposed to be indicated. The terms *omen* and *prodigy* were not, however, exactly synonymous; the former being applied rather to signs received by the ear, and particularly to spoken words; the latter to phenomena and occurrences, such as monstrous births, the appearance of snakes, locusts, etc., the striking of the foot against a stone or the like, the breaking of a shoe-tie, and even sneezing, etc. If an omen or prodigy was promised on the part of a god, it was to be interpreted according to the promise; but otherwise, the interpretation was extremely arbitrary. It was supposed that evil indicated as approaching might be averted by various means, as by sacrifices, or by the utterance of certain magic formulas; or by an extempore felicity of interpretation, as when Cæsar, having fallen to the ground on landing in Africa, exclaimed: "I take possession of thee, Africa." Occasionally, it is true, we read of a reckless disregard of omens; as, for example, when P. Claudius, in the first Punic war, caused the sacred chickens, who would not leave their cage, to be pitched into the sea, saying: "If they won't eat, they must drink." Still the belief in them was universal, and in general the greatest care was taken to avoid unfavorable omens. The heads of the sacrificial priests were covered, so that nothing distracting might catch their eyes; silence was enjoined at the commencement of every sacred undertaking, and at the opening of the *Ludi*. Before every sacrificial procession ran the heralds, calling on the people to "pay respect to it," and admonishing them to cease working till it should have passed, that the priests might not hear unfavorable sounds. At the beginning of a sacrifice the bystanders were addressed in the words *favete linguis* ("speak no word of evil import"), and the aid of music was sought to drown whatever noises might prove unpropitious. Compare AUGURIES AND AUSPICES, and DIVINATION. See also Fallati, *Ueber Begriff und Wesen des Röm. Omen* (Tüb. 1836).

The belief in omens has existed in all ages and countries, and traces of it linger even yet in the most civilized communities; in the dread, for instance, that many entertain at sitting down to table in a party of thirteen. Not a little of the philosophy of omens is contained in the Scottish proverb: "Them who follow freits, freits follow;" meaning, that a fatalistic belief in impending evil paralyzes the endeavor that might prevent it.

OMENTUM. See PERITONEUM.

OMISH, or AMISH, a branch of the Mennonites, founded in 1693, in Alsace, by Jacob Amman, from whom they derive their name. His special tenets were plainness in dress, absolute separation from the excommunicated, and washing of feet. His followers did not use buttons on their clothing, and were hence called *Häftler*, or "Hooker" Mennonites, while the rest of that body was called *Knöpfler*, or "Buttonites." Their number in this country is next to that of the old Mennonites.

OM'MANI PADME HUM is the "formula of six syllables" which has acquired much celebrity from the conspicuous part which it plays in the religion of the Buddhists, and especially in that form of it called *Lamaism* (q.v.). It is the first subject which the Thibetans and Mongols teach their children, and it is the last prayer which is muttered by the dying man; the traveler repeats this formula on his journey, the shepherd when attending his flock, the housewife when performing her domestic duties, the monk when absorbed in religious meditation, etc. It is met with everywhere; on flags, rocks, trees, walls, columns, stone-monuments, domestic implements, skulls, skeletons, etc. It is looked upon as the essence of all religion and wisdom, and the means of attaining eternal bliss. "These six syllables," it is said, "concentrate in themselves the favor of all the Buddhas, and they are the root of the whole doctrine . . . . ; they lead the believer to re-birth as a higher being, and are the door which bars from him inferior births; they are the torch which illuminates darkness, the conqueror of the five evils;" etc. They are likewise the *symbol* of transmigration; each syllable successively corresponding with, and releasing from, one of the six worlds in which men are reborn; or they are the mystical designation of the six transcendental virtues, each successive syllable implying self-offering (*dâna*), endurance (*kshânti*), chastity (*sîla*), contemplation (*dhyâna*), mental energy (*virya*), and religious wisdom (*prajnâ*). The reputed author of this formula is the Dhyâna-Bodhisattwa, or deified saint, *Avalokiteswara*, or, as the Thibetans call him, *Padmapâni* (i.e. the lotus-handed). It would not belong, accordingly, to the earliest stage of Buddhism, nor is it found in the oldest Buddhistic works of the north of India or of Ceylon. Its original sense is rather obscure. Some suppose that it means O! (*óm*), the jewel (*mani*) in the lotus (*padme*), amen (*hûm*); "the jewel" being an allusion to the saint Avalokiteswara himself, and the word "*padme*, or in the lotus," to the belief that he was born from a lotus. It is probably, however, more correct to interpret the formula thus: "Salvation (*om*) [is] in the jewel-lotus (*mani-padme*), amen (*hûm*);" when the compound word "jewel-lotus" would mean the saint and the flower whence he arose. If this interpretation be correct, the formula would be originally nothing more than a salutation addressed to Avalokiteswara or Padmapâni; and the mystical interpretation put upon each syllable of it, would then be analogous to that which imparted a transcendental sense to each of the letters of the syllable Om (q.v.). Dr. Emil Schlagintweit, in his valuable work on *Buddhism in Thibet* (Leipsic, 1863), relates (p. 120) that "in a prayer-cylinder which he had the opportunity of opening, he found the formula printed in six lines, and repeated innumerable times upon a leaf 49 feet long and 4 inches broad. When baron Schilling de Canstadt paid a visit to the temple Subulin, in Siberia, the lamas were just occupied with preparing 100,000,000 of copies of this prayer to be put into a prayer-cylinder; his offer to have the necessary number executed at St. Petersburg was most readily accepted, and he was presented, in return for the 150,000,000 of copies he forwarded to them, with an edition of the Kanjur, the sheets of which amount to about 40,000. When adorning the head of religious books, or when engraved upon the slabs resting on the prayer-walls, the letters of the formula are often so combined as to form an anagram. The longitudinal lines occurring in the letters "*mani padme hûm*" are traced close to each other, and to the outer longitudinal line at the left are appended the curved lines. The letter "*om*" is replaced by a symbolical sign above the anagram, showing a half-moon surmounted by a disk indicating the sun, from which issues a flame. Such a combination of the letters is called in Thibetan *nam chu vangdan*, "the ten entirely powerful (viz., characters, six of which are consonants, and four vowels);" and the power of this sacred sentence is supposed to be increased by its being written in this form. These kind of anagrams are always bordered by a pointed frame indicating the leaf of a fig-tree."—See also E. Burnouf, *Introduction à l'Histoire du Buddhisme Indien* (Paris, 1844); C. F. Koeppen, *Die Religion des Buddha* (Berlin, 1857–59); and the works quoted by these authors.

OMMI'ADES (Omaiades, or Ommeyades), a dynasty (deriving its name from an ancestor, Ommeyah) which succeeded to the Arabian caliphate on the death of Ali, the fourth caliph after Mohammed, and possessed it till superseded by the Abbasides (q.v.) in 750. Moawiyah, the founder of the dynasty, was the son of Abu-Soflau, who defeated Mohammed at Beder, and his mother was the notorious Hinda. After the death of Othman the third caliph, Moawiyah, who was his cousin, claimed the throne, and during the whole of Ali's reign ruled over the western provinces of Syria and Egypt; but it was not till the death of that caliph, and the abdication of his son Hassan in 661, that MOAWIYAH's authority was fully recognized. In that year he transferred the seat of the caliphate to Damascus; Kufa having been the residence of Ali, and Medina of the first three caliphs. The Arabs continued to extend their conquests during his reign; the Turks in Khorassan were subdued, Turkestan invaded, and several important acquisitions made in Asia Minor. But besides aggrandizing his empire, the caliph neglected no means of consolidating it, and partly for this reason he made the succession hereditary, and caused his son YEZID (680–83) to be recognized as his heir. The reigns of Yezid and his successors, MOAWIYAH II. (683) and MERWÂN I., formerly the traitorous secretary of the caliph Othman (683–85), are devoid of importance, as their sway extended only over Syria and Palestine. ABDULMELEK (685–705), an able and warlike prince, after a long and varying struggle of eight years, succeeded in rendering himself undisputed ruler of the Mohammedan world (692), but the latter part of his reign was much disturbed by rebellions in the eastern provinces. He was the first caliph who interested himself in the promotion of liberal knowledge, by causing the most celebrated poetical and other works of the Persians to be translated into Arabic; and under his reign coined money was first introduced. It was to this prince that his court-fool related the celebrated fabulous conversation between the owl of Bassora and that of Mosul. Four of his sons, WALID I. (705–16), SULIMAN (716–17), YEZID II. (720–23), and HESHÂM (723–42), successively occupied the throne, and a fifth son, Mosslemah, was, from his great military abilities and zealous devotion to the interests of his brothers, the terror of all their enemies, both domestic and foreign. Under Walid, the Ommiade caliphate reached the summit of its power and grandeur; northern Africa (709), and Spain (712), Turkestan (707), and Galatia (710) were conquered; while toward the close of his reign, his empire was extended even to the Indus. The slender structure of the minaret was now for the first time introduced into mosque architecture. OMAR II. (717–20), who, in the justice and mildness of his government, surpassed the whole of the race of Ommeyah, was appointed to succeed Suliman; but having excited discontent among his relatives, by suppressing the formula of malediction, which had hitherto been regularly pronounced at all public ceremonies against Ali and his descendants, he was poisoned. During his reign, Mosslemah had completed the conquest of Asia Minor, and even compelled the emperor Leo to submit to the humiliation of walking beside his horse through the principal streets of Constantinople itself, and paying a large ransom (equivalent to about £140,000) for his capital. Heshâm, though like his immediate predecessor, fond of pleasure, possessed all the qualities necessary for a sovereign. The Greeks, who still strove for the possession of Asia Minor, were repeatedly defeated: the fierce Turks of northern Persia and Turkestan, were kept in stern subjection; and the civil affairs of the empire carefully and strictly administered. The death of Mosslemah, the champion of the Ommiade dynasty, seems to have been the signal for insurrection; the descendants of Ali raised the standard of revolt, and no sooner were they subdued than Ibrahim, the fourth in direct descent from Abbas the uncle of Mohammed, solemnly invested the celebrated Abu-Mosslem (stated to be a descendant of Koderz, one of the most distinguished heroes of Firdusi's admired work the *Shah-nameh*) with the arduous duty of enforcing his long-agitated claims to the throne. During this reign the progress of Arab conquest in western Europe was checked by Charles Martel, who inflicted upon the Arabs a severe defeat at Tours (732), and almost annihilated their army at Narbonne (736). The reigns of WALID II. (742–43), YEZID III. (743–44), and IBRAHIM (744), though of ephemeral duration, were long enough to produce a complete disorganization of the empire; and though MERWÂN II. (744–50), the next and last caliph of the house of Ommeyah, was both an able and politic ruler, and a skillful warrior, the declining fortune of his family was beyond remedy. Abu-Mosslem, who had published the claims of the Abbasides amidst the ruins of Meru in 747, took the field at the head of a small but zealous band, and carried the black flag of the Abbasides from victory to victory, till before the close of the following year the whole of Khorassan acknowledged his authority. Irak was subdued in 749; and though Ibrahim the Abbaside claimant was seized by Merwân, and executed in the same year, his brother Abul-Abbas succeeded to his claims, and the unfortunate caliph, defeated in two engagements, fled to Egypt (750), whither he was pursued and slain. Abdallah, the uncle of the successful claimant, treacherously invited the remaining members of the house of Ommeyah to a conference, and ordered a general massacer of them. Two only escaped: the one to the s.e. of Arabia, where he was recognized as caliph, and his descendants reigned till the 16th c.; the other, Abderrahman, to Spain, where he founded the caliphate of Cordova.

OMMIADES OF SPAIN.—ABDERRAHMAN I. (755–787), on accepting the Spanish throne, which was offered him by the Arab chiefs, assumed the title of *Caliph* and *Emir-al-mumenin*, and in spite of numerous revolts, strengthened and extended his power in Spain, till, with the exception of Asturias and the country n. of the Ebro, his authority was everywhere acknowledged. His defeat of Charlemagne at Roncesvalles (q.v.) is too widely known to require further notice. He divided his kingdom into six provinces, whose rulers, with the *walis* of the twelve principal towns, formed a sort of national diet. His successors, HESHAM I. (787–93) and AL-HAKEM I. (796–821), were much troubled with internal revolts, under cover of which the Christians in the n.e. established the state known as the "Spanish March." ABDERRAHMAN II. (821–52) re-established internal quiet, and occupied his subjects with incessant wars against the Christians. These conflicts developed among the Arabs that chivalrous heroism which is found nowhere else in the Mohammedan world. Abderrahman, himself a man of learning, greatly encouraged the arts and sciences, and diffused information among his people; he also attempted, by regulating the laws of succession to property, to constitute his kingdom on a basis analogous to that of other European nations. During his reign Mohammedan Spain was the best governed country in Europe. His successors, MOHAMMED I. (852–80), MONDHAR (880–82), and ABDALLAH (882–912), followed in his footsteps. ABDERRAHMAN III. (912–61), after suppressing some dangerous revolts which had gathered head during his minority, conquered the kingdom of Fez from the Edrisites, and brought a long and exhausting war with the powers of Asturias and Leon to a victorious conclusion. This period is justly termed the golden age of the Arab domination in Spain, for at no period was their power so consolidated, and their prosperity so flourishing. Abderrahman, like his predecessors, was a great encourager of learning, and a poet of no mean ability. He founded schools which far surpassed those in other parts of Europe. His son, AL-HAKEM II. (961–76), was in every way worthy to be his successor, but his premature death was the cause of the downfall of the Ommiades in Spain. HESHAM II. (976–about 1013), a child of eight years, now occupied the throne; but fortunately his mother, Sobeiha, possessed the abilities necessary for such an emergency, and appointed as her son's vizier Mohammed ben Abdallah, surnamed Al-Mansor, who had originally been a peasant. This remarkable man gained the affections of all ranks by his pleasing manners and great abilities; his administration was equally just and judicious, and his encouragement of literature, science, and art alike liberal and discriminating. But it is as a warrior that he is chiefly remembered; he had vowed eternal enmity to the Christians, and in all his numerous expeditions fortune seemed chained to his standard. The lost provinces were recovered; Castile, Leon, and Barcelona were conquered; and Navarre was on the point of sharing the same fate, when a rebellion in Fez compelled him to detach a portion of his force for service in Africa, and the combined armies of the four Christian monarchies, seizing this opportunity, inflicted upon the Arabs a sanguinary defeat in 1001. Mohammed's spirit was completely broken by this blow, and he died a few days afterwards. With him the star of the house of Ommeyah set for ever. The rest of Hesham's reign was a scene of disorder and civil war. Pretenders to the caliphate arose, while the "walis" of the various provinces set up as independent rulers, and the invasions of the Christians added to the confusion. Hesham finally resigned the throne about 1013; and, with the exception of the brief reign of Hesham III. (1027–31), from this time the family of Ommeyah, which had for more than two centuries so happily and brilliantly governed the greater part of Spain, disappears from history. One remarkable feature of their rule deserves mention, as it contrasts them so favorably with the contemporary and subsequent rulers of Spain, even to the present time, and that is their universal toleration in religious matters.

OMNIBUS (Lat. *omnibus*, "for all,"), familiarly contracted into "bus," is the largest kind of public street conveyance, and is appointed to travel between two fixed stations, starting at certain fixed hours, and taking up or setting down passengers at any point on its route. Vehicles of this sort were first started in Paris in 1662, when it was decreed, by a royal edict of Louis XIV., that a line of *carosses à cinq sous* ("twopence-halfpenny omnibuses"), each containing eight places, should be established for the benefit of the infirm, or those who, requiring speedy conveyance from one part of the town to another, were unable to afford a hired carriage for themselves; these "carosses" were bound to run at fixed hours from one station to another, whether full or empty. The public inauguration of the new conveyances took place March 18, 1662, and was the occasion for a grand fête; and the novelty took so well with the Parisians, that the omnibuses were for some time monopolized by the wealthier classes. However, when the rage for them died away, it was found that those for whose special benefit they were instituted made no use of them, and they, in consequence, gradually disappeared. The omnibus was not revived in Paris till 1827, when it was started in its present form, carrying from 15 to 18 passengers inside, with only the driver above and the conductor behind; and on July 4, 1829, they were introduced into London by a Mr. Shillibeer. Shillibeer's conveyances, which for some time afterwards were known as *shillibeers* (an epithet still in common use in New York), were of larger size than the French ones, carrying 22 passengers inside, and were drawn by three horses abreast. The omnibus was introduced into Amsterdam in 1839, and since that time its use has been extended to all large cities and towns in the civilized world. The seats of the omnibus are generally placed lengthwise, and the door behind. The omnibus is managed by a driver and a conductor. In New York, omnibuses are drawn on street-railways; and this practice is now being extensively employed in the chief towns of Great Britain, where the omnibuses are called tramway cars, and the railway a tramway.

OMNIUM, a term used at the stock exchange to express the aggregate value of the different stocks in which a loan is funded. See M'Culloch's *Dictionary of Commerce.*

OMSK, a t. of the Russian province of Central Asia, in the government of Akmollinsk, stands at the confluence of the Om—a river upwards of 200 m. in length—with the Irtish; 2,225 m. from St. Petersburg. Lat. 54° 59′ n., long. 73° 30′ east. It was built in 1716, as a defense against the Khirghiz; but is now of no importance as a fortress. It was till a recent date the center of government for Western Siberia, the center of the administration of the Siberian Khirghiz, the seat of the courts of justice, and of the Siberian corps of cadets. It contains manufactories and mining works. Hitherto its commerce has been limited to a trade with the Khirghiz, who drive up their cattle to this place; but its advantageous position on the great post-road and commercial line of traffic from Europe across the whole of Siberia to the Chinese frontier, makes it probable that it will some day become an intermediate station for extensive commercial exchanges. Pop. '67, 26,722.

OMUL, *Salmo migratorius*, a fish of the salmon and trout tribe, abounding in lake Baikal and other waters of the e. of Siberia, from which great quantities are sent salted to all the western parts of that country. In size it is rarely more than 15 or 16 in. long. Its flesh is very white and tender. It ascends rivers in shoals for the purpose of spawning.

ON. See HELIOPOLIS, *ante.*

O'NAGER. See ASS.

ONAGER. See BALISTA.

ONAGRA'CEÆ, ONAGRARIÆ, or ŒNOTHERA'CEÆ, a natural order of exogenous plants, consisting chiefly of herbaceous plants, but including also a few shrubs; with simple leaves, axillary or terminal flowers; the calyx superior, tubular, sometimes colored, its limb usually 4-lobed; the petals inserted into the throat of the calyx, generally equal in number to its segments; the stamens generally 4 or 8, rarely 1 or 2, inserted along with the petals; the ovary generally 4-celled, sometimes 2-celled; the style thread-like, the fruit a capsule or a berry. There are about 450 known species, natives chiefly of temperate climates, among which are some much cultivated for the beauty of their flowers, particularly those of the genera *fuchsia*, *œnothera* (evening primrose), *clarkia*, and *godetia.* The British genera are *epilobium* (willow-herb) and *circæa* (enchanter's nightshade). A few species produce edible berries, and the roots of 1 or 2 are eatable; but none are of economical importance. The root of *isnarda alternifolia*, found in the marshes of Carolina, and called *Bowman's root*, is emetic. Some species of *jussiæa* are used in dyeing in Brazil.

ONAGRACEÆ (*ante*), a natural order of exogenous herbs constituting the evening primrose family, principally found in America, but also inhabiting temperate latitudes in the eastern continent. There are several genera, the principal of which are *circæa*, *epilobium œnothera*, and *Ludwigia.* Circæa, or enchanter's nightshade, named from Circe the enchantress, is a low perennial, growing in cool or damp woods; calyx tube slightly prolonged, deciduous; lobes 2, reflexed; petals 2, inversely heart-shaped; stamens 2; pod does not split open. Two species from Europe, *C. lutetiana*, and *C. alpina.* *Epilobium* or willow herb, has several species in this country, most of them brought from Europe. The great willow herb, *E. nugustifolium*, has a simple, tall stem from 4 to 7 ft. high, with lanceolate leaves, and grows on low grounds, in newly cleared lands; flowers pink-purple, very showy. *E. alpinum* is found on the summits of the White mountains, and also the Adirondacks. It is only from 2 to 6 in. high, nearly smooth; stem simple; leaves ovate-oblong, obtuse, on short leaf stalks; flowers few or solitary, drooping in the bud; petals purple; pods long, smooth. *E. molle* (Torrey), native in bogs from Rhode Island to Pennsylvania and Michigan northward. It grows from one to one foot and a half high; soft-downy all over; erect, branching toward the top; leaves crowded; linear-oblong or lanceolate; petals rose color, small. Œnothera, or the evening primrose, is the principal genus. *Œ. biennis*, or the common evening primrose, has ovate-lanceolate leaves, acute, obscurely notched; flowers in a terminal spike; calyx much prolonged; petals inversely cordate, light yellow color; pods oblong; several varieties, as *muricata*, *grandiflora*, *parviflora*, *cruciata*, and *oakesiana.* The other species of œnothera are *rhombipetela* (having rhombic petals), *sinuata*, *glauca*, *fructiosa* (sundrops), *riparia*, *linearis*, *chrysantha*, *serrulata*, and *pumila*. This latter grows southward along the Alleghanies, flowering in June. The *Œ. serrulata* is found at the falls of St. Anthony, and in Wisconsin and westward. In the genus *Ludwigia*, or false loosestripe, the calyx tube is not at all prolonged beyond the ovary; petals 4, small or wanting; stamens 4; pod short, many seeded; seeds minute and naked. Named in honor of Christian G. Ludwig, professor of botany at Leipsic, contemporary with Linnæus. The seed-box and water purslane are species belonging to this genus, the former growing in swamps along the coast, the latter in swamps or ditches, and very common.

ONCIDIADÆ, a family of gasteropod mollusks, belonging to the section *pulmonifera*, division *inoperculata*. The animal is slug-like and without a shell. The body resembles that of the garden slug, but has a shield-like leathery covering to the back; head continuous with the body, and the eyes at the end of non-retractile cylindrical pedicels which spring from near the antero-lateral margins. There are no tentacles, and the lingual ribbon is broad, with nearly uniform teeth in numerous, straight, transverse rows. There are several genera, the species living in damp places near either fresh or salt water, and they are supposed to live on vegetable food. They are tropical, or inhabit warm climates, with the exception of one species, *peronia celtica*, which is British.

ONCKEN, Johann Gerhard, b. at Varel, Oldenburg, Germany, about the year 1800. In early life he was a domestic servant; afterward lived in England, where he married. At Hamburg he joined an English Independent church, opened a book-store, and acted as agent of the Lower Saxony tract society and the Edinburgh Bible society. In 1834 he organized a Baptist church with 6 others, and became its pastor. In 1835 the American Baptist general convention appointed him their missionary. As such he visited nearly all Germany and Denmark. He was imprisoned several times in Hamburg for preaching and baptizing, but the kindness shown by his family and congregation to those who had suffered by the great fire in 1842 led the senate to grant them unconditional liberty of worship. Since that time Oncken has zealously performed his mission work, preaching, baptizing, distributing the Scriptures, writing, and publishing religious books and tracts, establishing churches in Denmark, Switzerland, Austria, and some of the states of Germany, editing, with the aid of his daughter, a religious periodical in English, and another in German. In 1852 he visited the United States to obtain funds for the erection of chapels. The number of churches which he established in 30 years was 76, with 11,289 church members. Connected with these churches are 95 Sunday-schools, 240 teachers, and 2,662 scholars,

ONCOCARPUS, a genus of trees of the natural order *anacardiaceæ*. One of the most remarkable trees of the Fiji islands is *O. atra*, or *O. vitiensis*, a tree about 60 ft. high, with large oblong leaves and a corky fruit, somewhat resembling the seed of a walnut; the sap of which, if it comes into contact with the skin, produces a pain like that caused by red-hot iron. The wood is often called itch-wood, because of the effect produced on persons who ignorantly or incautiously bark it whilst the sap is fresh, even the exhalations causing an intolerable itching and innumerable pustules, with excessive irritation for several days, whilst the effects continue to be unpleasantly felt even for months.

ONDERDONK, Benjamin Tredwell, d.d., ll.d., 1791–1861; b. New York; graduated at Columbia college 1809; ordained a presbyter in the Protestant Episcopal church 1813; was a professor in the General theological seminary 1826–35; bishop of the diocese of New York 1830–45, when, having been tried by the house of bishops on charges preferred against him, he was suspended from the exercise of his official functions.

ONDERDONK, Henry Ustick, ll.d., 1789–1858; b. New York; graduated at Columbia college 1805; studied medicine in London, and took the degree of m.d. at Edinburgh 1810; studied theology and was ordained deacon in the Protestant Episcopal church 1815; settled at Canandaigua, N. Y., 1816–20; rector of St. Ann's church, Brooklyn, N. Y., 1820–27; assistant bishop, and, on the death of bishop White, bishop of the diocese of Pennsylvania 1827–44, when, having been tried by the house of bishops, on charges preferred against him, was suspended; was restored 1856, but did not resume the active exercise of his office.

O'NEALL, John Belton, ll.d., 1793–1863; b. S. C., a graduate of the university of South Carolina at Columbia, class of 1812, and was a teacher in the Newberry academy. He studied law, but left his reading to carry a musket in the war with England that occurred in that year, returning in due time to the more limited field of litigation, was admitted to the bar in 1814, inaugurating a successful practice. He represented his district in the legislature of his native state in four sessions, 1816, '22, '24, and '26; was elected speaker in '24 and again in '26. He rose rapidly to distinction as a jurist. In 1828 he was appointed associate judge; in 1830 judge of the court of appeals; in 1850 presiding judge of the court of errors and the court of law appeals, and filled the office of chief justice of the supreme court of South Carolina. In 1832 he gave up the use of stimulants, and in 1841 was elected president of the state temperance society. He was an active philanthropist, and in 1852 was elected to fill the highest office in the order of sons of temperance of North America. He wrote *A Digest of the Negro Law of South Carolina*, *Annals of Newberry, S. C.*, and *Biographical Sketches of the Bench and Bar of*

South Carolina, and contributed reminiscences of the revolution to the *Southern Literary Messenger.*

ONE'GA, a small t. and sea-port in the n. of Russia, in the government of Archangel, and 90 m. s.w. of the city of that name. It stands at the mouth of a river, and on the shore of a gulf of the same name; the latter a branch of the White sea. Lat. 63° 54′ n., long. 38° 7′ east. Pop. '67, 2,209, employed in connection with the saw-mills of the "Onega Trading Wood Company." In these mills, where numerous men are at work, an English steam-engine has been erected. About 50 ships leave the port annually for England, with cargoes of deals and timber to the value of £37,000.

ONEGA, Lake, an extensive lake in the n. of Russia, government of Olonetz, and, after Ladoga, the largest lake in Europe; is 59 m. in greatest breadth, and about 150 m. in length. Area, 3,720 sq. miles. It is fed by numerous rivers, and receives through the river Wodlo the waters of the lake of that name. Its only outlet is the river Swir, which flows s.w. into lake Ladoga. By means of the Mariinsky system of communication, lake Onega communicates with the Volga, and thence with the Caspian sea on the s., and with the Dwina, and thence with the White sea on the north. The clear and beautiful waters of this lake are rich in fish, and embrace many islands. The depth ranges from 550 to 700 ft. The navigation of the lake is dangerous, and commerce is chiefly confined to the Onega canal, which extends from the town of Vytegra on the river of that name to the river Swir.

ONE'GLIA, a t. of n. Italy, in the province of Porto Maurizio, on the gulf of Genoa, 40 m. e.n.e. from Nice, at the mouth of the Impero, a small river which rushes down from the Apennines. The harbor is not good. The principal article of export is oil. Andrea Doria, the great Genoese admiral was born here. Pop. about 8,000.

ONEI'DA, a co. in s.e. Idaho, having Montana on the n., Wyoming on the e., Utah on the s., and the Snake river and its tributaries on the n. and w.; 17,850 sq.m.; pop. '80, 6,965—5,028 of American birth, 72 colored. It is drained by the Snake river, Port Neuf, Blackfoot, and John Gray's, the Port Neuf irrigating a large section of arable land set off for an Indian reservation. Bear lake valley in the s.e. contains a Mormon settlement, whose inhabitants are engaged principally in farming. Gold is found, and there are salt, medicinal, and hot springs. In the n.e. portion the land rises into three high mountains, one of them, mount Hayden, 13,858 ft. above the level of the sea. A large proportion of the county is covered with pine forests, the elevated portions affording excellent pasturage. The soil of the river bottoms is very fertile, but for the most part uncultivated. Co. seat, Malad City.

ONEI'DA, a co. in central New York, having Oneida lake and Oneida creek for a portion of its w. boundary, and West Canada creek on the e.; drained by the Mohawk, Black, Oriskany, and Fish rivers; 1215 sq.m.; pop. '80, 115,475—92,038 of American birth, 622 colored. It contains the head-waters of the Chenango and Unadilla rivers, and Trenton falls of West Canada creek, having 5 cascades and a total descent of 400 ft. in a course of 2 miles. Near the falls are quarries of Trenton limestone; other mineral products are iron ore, gypsum, peat, and marl. Its soil is exceptionally fertile, especially in the Mohawk valley extending across the county from e. to w., and spreading out into broad green fields diversified by pasture lands of superior elevations, celebrated for its wild and rough, but charming scenery. N. and s. of this valley the surface is hilly. It is intersected by the Erie and Chenango canal, the Black River canal, and Oneida Lake canal, also by the New York Central and Hudson River railroad, the Utica and Black River, the Rome, Watertown and Ogdensburg, and the Utica, Chenango and Susquehanna Valley railroads. Its agricultural products are grain, live stock in great numbers, dairy products, maple sugar, hops, and potatoes. The leading industries are the manufacture of furniture, wooden-ware, lime, cement, cotton and woolen goods, metallic wares, boots, and shoes, hosiery, iron castings, etc. It has distilleries, breweries, flour, saw, and lumber mills. Co seat, Utica.

ONEI'DA, a village in Lenox township, Madison co., N. Y., at the junction of the New York and Oswego Midland, and the New York Central and Hudson River railroads; pop. '70, 3,262. There are 3 weekly newspapers, 2 banks, and an academy. The village is the center of a flourishing country trade.

ONEI'DA COMMUNITY (Perfectionists, *ante*), after continuing 30 years unmolested in the practice of what they called "complex marriage," every man being considered as married to every woman and every woman to every man, found themselves surrounded with a state of public opinion that led to a resolute effort to break up this offensive feature of their association. In 1879 a conference of clergymen of different denominations and from the principal cities in the state of New York, was held at Syracuse to form a plan for eradicating the evil. A committee then appointed proceeded to collect evidence bearing on the actual practices of the community. Before their report was published the effect of the agitation of the subject was manifested in a proposition made by the leader of the community to its managers to abandon the distinctive feature of their association; not because they were convinced of its immorality, but in deference to the public sentiment that was evidently rising against it. This proposition having been accepted by the managers, an announcement was afterward publicly made that the Oneida community had abandoned what they had called "complex marriage," and would hereafter be divided into the regularly married and those who prefer to remain single. And this was followed in due course by articles of association being filed, according to law under the name of the Oneida community "*limited*," which was to be the same as the old association of the same name, except that the marital relations of its members were changed.

ONEI'DA LAKE, in central N. Y., 18 m. long by 6 m. wide, and 12 m. n.e. of Syracuse, occupying portions of Oneida, Madison, Oswego, and Onondaga counties. It is 369 ft. above the level of the sea, abounds in fish of excellent quality, and empties into the Oneida river.

ONEI'DAS, a tribe of American Indians whose name signifies "tribe of the granite rock." Originally belonging to the Mohawks, they were set off from them and formed part of the Iroquois confederation of Six Nations. Their possessions included the section of country between Deep Spring near Syracuse, Onondaga co., N. Y., and a point directly e. in the vicinity of Utica, Oneida co., and embracing the lake which takes its name from them. Their *totem*, or symbol, was a stone in a forked stick. The tribe was divided into 3 clans, the wolf, bear, and turtle, and 9 sachemships. In the earliest years of the settlement of Canada they sustained hostile relations with the French, and the Hurons, and Montagnas, who were friendly to the Canadian settlers—only occasionally relaxing their enmity sufficiently to permit the visits of missionaries; and although their fellow members of the confederation, the Onondagas, made peace with the French in 1665, they kept up the war until 1666; the French making two raids into their country. At the time of the treaty they were reduced to 150 warriors, who joined in the general treaty of peace with the French, Sept. 8, 1700, being governed thereafter in their movements by the English, until the revolution, when they with the Tuscaroras were faithful to the colonists. This was owing to the influence of Samuel Kirkland, a Congregational minister, appointed missionary in 1766 by a missionary board in Connecticut who settled in the midst of the tribe and was with them when the war broke out. He left them at that time to fill a chaplaincy in the army, but was engaged in negotiations with them throughout the war, and accompanied some of their warriors in 1791 to the meeting of congress in Philadelphia. By their fidelity to the colonists they incurred the enmity of other tribes, who, led by Joseph Brant or Thayendanega, a famous chief of the Mohawks and leader of the Iroquois, drove them from their homes and burned their church and houses; in this aided and abetted by the British and their adherents. At the close of the war they with the Tuscaroras were the only members of their confederation who remained in the United States, the remainder settling on Grand river in Canada. By the treaty of fort Stanwix, Oct. 23, 1784, they were confirmed in their title to their lands, and in 1785 and 1788 the state of New York purchased their lands, with the exception of a reservation for each, which was never to be sold, and leased only in part. The Brotherton and Stockbridge Indians retained their lands which they had received from them and now live on the same reservation. In 1840, 430 emigrated to Canada. Those who settled at Green bay, Wisconsin, purchased the lands, and have erected churches, and availed themselves of educational privileges, advancing as fast as possible in agriculture and mechanical arts. There are 65,000 acres of land in this reservation, the inhabitants numbering 1279 in '73. They are mostly Episcopalians, the book of Common Prayer having been translated into their language. There were in 1873, 633 on the Thames, in the province of Ontario, and 266 in New York near Oneida castle, 20 m. s. of Utica, having 2 schools. The number in the year indicated belonging to the tribe is larger than at any time since the advent of white population into their domain, and double their number at the close of the war. Several works have been written on this tribe and the Iroquois confederacy, beginning with Colden's *History of the Five Nations*, 1727, and leading up to works on the celebrated chieftains which were published as late as 1864 and 1866. In the war of 1812 the English and American parties in the Iroquois confederation were as sharply divided and took the same sides as in the revolution, but the Oneidas stood by the Americans always, and have since been at peace.

ONEROUS CAUSE, in Scotch law, means a pecuniary or valuable consideration.

ONGARO. See DALL' ONGARO, FRANCESCO, *ante*.

ONION (Fr. *oignon*, from Lat. *unio*, a pearl, but found in Columella, signifying a kind of onion), the name given to a few species of the genus *allium* (q.v.), and particularly to *A. cepa* (Lat. *cepa*), a biennial bulbous-rooted plant, with a swelling stem, leafy at the base, tapering fistular leaves, a reflexed spathe, a large globose umbel, usually not bulbiferous, the lobes of the perianth obtuse and hooded, not half as long as the stamens. The bulb is simple—not composed of cloves like that of garlic; and in the common variety is solitary, showing little tendency to produce lateral bulbs. The native country of the onion is not certainly known, some supposing it to be India and some Egypt, in both of which it has been cultivated from the most remote antiquity. The part chiefly used is the bulb, but the young leaves are also used and young seedlings drawn from onion beds are a very common ingredient in soups and sauces in the beginning of summer. These are known in Scotland as *syboes* (evidently another form of the word *cibol*). In warmer climates the onion produces a larger bulb and generally of more delicate flavor than in Britain; and is more extensively used as an article of food, being with us whether fresh or pickled, generally rather a condiment. In Spain and Portugal a raw onion is often eaten like an apple, and often with a piece of bread forms the dinner of a working-man. The onion is, however, very nutritious. It contains a large quantity of nitrogenous matter and of uncrystalizable sugar; with an acrid volatile sulphurous oil, resembling oil of garlic. The oil of the onion is dissipated by boiling so that boiled onions are much milder than raw onions. In Britain onions are sown either in spring or in August. Great fields of them as of other favorite vegetables are cultivated for the London market; and large quantities of onions are also imported from more southern regions. The Bermudas are celebrated for their onions. The onion loves a rich light soil and a dry subsoil. The transplanting of onions is often practiced, especially of onions sown in autumn which are transplanted in spring, and when these are placed so that the small bulbs are on the surface of the ground, and surrounded with decayed manure, very large bulbs are obtained. The frequent stirring of the soil is of great advantage. The bulbs are taken up when the leaves decay, and after being dried in the open air or in a loft, may be kept for a considerable time.—The POTATO ONION, also called the EGYPTIAN or GROUND ONION, is a perennial variety which produces offset bulbs at the root like the shallot; but the bulbs are much larger than those of the shallot and have less of the flavor of garlic, although stronger than those of the common onion. It is sometimes said to have been introduced into Britain from Egypt by the British army in 1805, but erroneously, as it was cultivated in some parts of Britain long before. It is in very general cultivation among the peasantry in some parts of Scotland.—The PEARL ONION is a similar variety with much smaller bulbs.—The TREE ONION is also generally regarded as a variety of the common onion. It produces bulbs at the top of the stem, the umbels becoming viviparous.—Onions are similar to garlic (q.v.) in medicinal properties but milder. As a condiment or article of food they agree well with some stomachs and stimulate digestion, but are intolerable to others. Roasted onions with oil make a useful emollient and stimulating poultice for suppurating tumors. The use of onions stimulates the secreting organs.—The CIBOL or WELSH ONION (*A. fistulosum*), a native of Siberia, cultivated in Britain but more generally in Germany, has a perennial fibrous root with no bulb, very fistular leaves and a 3-cornered ovary It is useful as supplying tender green leaves for culinary use in the beginning of spring, like the chive, and somewhat earlier in the season. It is much larger than the chive but its use is similar.

ONIS'CUS. See WOODLOUSE.

ON'KELOS, the supposed author of an Aramaic version (Targum) of the Pentateuch. The name seems a corruption from that of Akilas, one of the Greek translators of the Old Testament (see AQUILA). The translation said to be by Onkelos, is, in its present shape at least, probably the work of the Babylonian schools of the 3d and 4th centuries A.D. At first orally transmitted, various portions of it began to be collected and written down in the 2d c., and were finally redacted about the time mentioned. The history of the origin and growth of Aramaic versions in general will be treated under *Targum* (VERSIONS). The idiom of Onkelos closely resembles that of Ezra and Daniel. The translation itself is executed in accordance with a sober and clear, though not a slavish exegesis, and keeps closely to its text in most instances. In some cases, however, where the meaning is not clear it expands into a brief explanation or paraphrase, uniting the latter sometimes with Haggadistic by-work, chosen with tact and taste, so as to please the people and not to offend the dignity of the subject. Not unfrequently it differs entirely from the original, as far e. g., as anthropomorphisms and anthropopathies—anything, in fact, which might seem derogatory to the Deity—are concerned. Further may be noticed a repugnance to bring the Divine Being into too close contact, as it were with man, by the interposition of a kind of spiritual barrier (the "word," "Shechinah," "glory") when a conversation or the like is reported between God and man. Its use lies partly in a linguistic, partly in a theological direction; but little has been done for its study as yet. Notwithstanding the numerous MSS. of it extant in almost all the larger libraries of Europe, and in spite of the grossly incorrect state of our current printed editions, no critical edition has ever been attempted.

ONOBRY'CHIS. See SAINTFOIN.

ONOMAC'RITUS, a celebrated religious poet of ancient Greece, lived at Athens in the time of the Peisistratidæ. He collected and expounded—according to Herodotus—the prophecies or oracles of Musæus (q.v.), but is said to have been banished from the city by Hipparchus, about 516 B.C., on account of interpolating something of his own in these oracles. He then, we are told, followed the Peisistratidæ into Persia, and while there was employed by them in a very dishonorable way. They got him to repeat to Xerxes all the ancient sayings that seemed to favor his meditated invasion of Greece. Some critics, among whom is Aristotle, have inferred from a passage in Pausanias that Onomacritus is the author of most of the so-called Orphic hymns. More certain, however, is the view which represents him as the inventor of the great Orphic myth of Dionysud Zagreus, and the founder of Orphic religious societies and theology. Pausanias states that "Onomacritus established orgies in honor of Dionysus, and in his poems representes the Titans as the authors of the sufferings of Dionysus." See Müller's *Geschichte der*

Griech. Literatur bis auf das Zeitalter Alexander's (Breslau, 1841); Grote's *History of Greece*, etc.

ONOMATOPŒ'IA, the Latin form of the Greek word *onomatopoiïa*, means literally the making or invention of names, and is used in philology to denote the formation of words in imitation of natural sounds, as in *cuckoo*, Lat. *cucu* (lus); *pee-wit*, Scan. *pee-weip*, Dutch, *kiewit; cock; clash, rap, tap, quack, rumble, whizz, clang*. Such words are sometimes called onomatopœias; more properly they are onomatopœian, or formed by onomatopœia.

In a more extended sense, the term is applied to the rhetorical artifice by which writers (chiefly poets) seek, through the choice and arrangement of words, to make the "sound," throughout whole phrases and sentences, "an echo to the sense," as in Homer's well-known *poluphloisboio thalasses*, expressive of the breaking of the waves upon the sea-shore; or where Tennyson makes the sea

Roar rock-thwarted under bellowing caves.

The occurrence of so many obviously onomatopœian words in all known languages, suggests the question, whether the same principle may not have been concerned in producing the original germs or roots of the great bulk of words. There is little hope that the question will ever be conclusively settled either way; for the changes of time have made it, in most cases at least, impossible to say what the first form and signification of a root were; but the balance of arguments seems in favor of the affirmative answer. "The action of the mind," as it has been expressed, "produced language by a spontaneous repercussion of the impressions received." Now, the articulate sound first affixed in this way to an object or an action as its sign cannot be conceived as arbitrary; nor is there any mysterious and inherent correspondence between any one conception of the mind, and a particular articulate sound. The sound uttered must have been suggested by something connected with the object or action itself; and by what more naturally than by the inarticulate sound which the object or action itself emits '

The chief objection to this theory is, that if the first words were merely reproductions of natural sounds, the same natural objects would have had the same names all the world over. To which it is answered, that the mind in its first efforts at naming did not seek an exact reproduction of the sound, but a suggestive imitation; primitive words were not echoes, but "artistic representations." Now, the sounds of nature are not simple, but composite. Like other concrete phenomena, they present a variety of aspects; and according as one or another aspect seemed the most prominent to the observer, a different vocal sound would suggest itself as the appropriate symbol. Thus when professor Max Müller argues (*Science of Language*, Lond. 1861) that if the "bow-wow" theory, as he nicknames it, were true, men would have everywhere spoken of a *moo*, as is done in the nursery, and not of a *cow;* it seems a valid answer to say, that the Indian *gu*, the Teut. *kuh* (Eng. *cow*), and the Græco-Lat. *bou-*, are really as suggestive imitations of the animal's actual voice as *moo*. To take a more striking instance: few words differ more in sound and aspect than the Eng. *thunder* (Ger. *donner*, Lat. *tonitru*, Fr. *tonnère*) does from the Mexican name for the same thing, *tlatlatnitzel*, and yet it would be difficult to say which is the more suggestive of the natural sound.

It is no doubt true that the great bulk of names are derived from roots having a general predicative power; but this by no means excludes the principle of onomatopœia. Thus, to take one of the instances adduced by professor Müller himself, that of *raven* or *crow* (Sans. *kârava*, Lat. *corvus*, Gr. *korônê*); this is derived from the root *ru* or *kru*, which means to cry or call, and the bird was called a kârava, or crow, not in imitation of his voice, but because he was "a shouter, a caller, a crier. The name might have been applied to many birds, but it became the traditional and recognized name of the crow." But how came the articulation *ru* or *kru* to be chosen to convey the general meaning of crying or calling; may we not suppose that it was suggested by the voice of birds of the crow kind, whose notes are most markedly cries or calls to their fellows, as distinguished from singing? Once adopted in this particular case, it would naturally be extended to any kind of cry or call, from the harshest to the softest.

ONONDA'GA, a co. in central New York, separated from lake Ontario by Oswego co., and bounded also on the n.e. by Oneida lake and river, and on the s.w. by Skaneateles lake; drained by Seneca river and Chittenango and Onondaga creeks; intersected by the Erie canal, the New York Central railroad, and minor lines centering at Syracuse (q.v.); pop. '80, 117,887—94,509 of American birth. The surface is level in the w. and undulating or hilly in the east. There is excellent farming land, producing all the cereals. The dairy products are large and noted for their excellence. Salt, gypsum, and limestone suitable for building purposes are found. Co. seat, Syracuse; there are about thirty other towns and villages.

ONONDA'GA LAKE, in Onondaga co., N. Y., near Syracuse, is 5 m. long, about a mile wide, and its greatest depth is 65 feet. Its waters are saltish and stagnant, and, as there are extensive salt formations in the vicinity, it is supposed that the lake was formed by the gradual dissolving of the salt rock and the consequent falling in of the ceiling of the cave thus formed. Seneca river is the outlet.

ONONDA'GAS, one of the five tribes of Iroquois Indians which inhabited and gave their name to Onondaga county, N. Y.; these five tribes forming a confederacy, which was ruled over successively by 14 great sachems, the *atotarho*, the Onondaga chief, being the first; they had charge of the wampum belts, the treaties, and the council fires, and their dialect was considered the purest and grandest of the confederacy. Their principal village was about 5 m. from Syracuse. It is not known in what year the confederacy was formed, but as early as 1609 they were waging war with their neighbors, the Hurons, against whom they were bitterly hostile; and in 1649 gathered their forces and devastated the settlement of the Hurons, many of whom were killed and some made prisoners, the whole tribe being scattered. Then followed an unsuccessful war with the Eries and Susquehannas. In 1653 a treaty of peace of short duration was effected with the French, who, at the solicitation of the Onondagas, sent missionaries among them, and established a settlement there, which was abandoned a year later on the settlers discovering a plot for their massacre by the Indians. The Onondagas were continually at war with the Algonquins of Canada, and in 1662 they devastated Montreal island and killed the renowned Indian fighter Lambert Closse. In 1668 the French again settled among them. Onondaga county became alternately the rendezvous for the French and English; the latter a few years later building a fort there, which was demolished by the Indians before their withdrawal from the town during Frontenac's incursion in 1696. A general treaty of peace was signed in 1700, between the French and the Onondagas at Montreal, which lasted 9 years. They took sides with the English in the French and Indian war, 1756-63, and also during the latter part of the revolutionary war, in which they suffered severely. They ceded the most of their land to New York in 1798, reserving a small portion for themselves, where about 340 of them still remain, some of whom have been converted to Christianity. About 400 of the tribe are found in Ontario, Canada, and a few have joined the Senecas and Tuscaroras. They number about 860 in all.

ONSLOW, a co. in s.e. North Carolina, bounded on the s.e. by the Atlantic ocean, watered by the New river; about 700 sq.m.; pop. '70, 7,369. The surface is even, much of it swamp or sandy barrens. The soil is fertile, and produces good crops of Indian corn, sweet-potatoes, rice, and cotton. Tar and turpentine are manufactured. Co. seat, Jacksonville.

ONSLOW, GEORGE, 1784-1853; b. France; descended from a noble English family, son of hon. Edward Onslow, the youngest son of the earl of Onslow, who married a French lady and settled in France. He married a wealthy lady of Rouen, was rich himself, and passed his life in elegant retirement on his estate near Clermont. Devoting his time to the study of music, in which he had been carefully instructed by Dussek, Cramer, and Hullmandel, on the piano-forte, and in harmony and composition by the celebrated Reicha, a professor of the conservatoire. He cultivated his talent with such success that he early won distinction among the artists of his time. He was the author of a number of concertos for the piano-forte with orchestral accompaniments, quintets, quartets, symphonies, and sonatas, which are still performed. The most esteemed are his quintets for 2 violins, viola, and two violoncellos. He wrote in 1824 *L'Alcalde de la Vega*, and in 1827 *Le Colporteur*, both operas being well received, and in 1837 *Le Duc de Guise*. He was a member of the academy of fine arts, being the successor of Cherubino, and when he died, Haleny pronounced his eulogy.

ONTA'RIO, the easternmost and smallest of the five great lakes of North America, lies in 42° 10' to 44° 8' n. lat., and 76° 30' to 80° w. long. At its s.w. corner it receives the waters of the upper lakes by the Niagara, and at its n.e. corner it issues into the St. Lawrence; which for some distance below is called the lake of the Thousand Isles. Its surface, which varies a few feet with the seasons, is about 330 ft. below that of lake Erie and 234 ft. above tide-water. Its bottom, therefore, must be considerably lower than the level of the Atlantic, as it is in some places 600 ft. deep. It is 190 m. long, 55 in its widest part, and about 480 in circumference. Sufficiently deep throughout for vessels of the largest tonnage, it has many convenient and thriving ports, of which the chief are Kingston, Port Hope, Cobourg, Toronto, Hamilton, on the Canadian shore, and Oswego, Sackett's Harbor, Port Genessee in the United States. Its navigation has been facilitated by the erection of 15 light-houses on the American side, and 13 on the Canadian; while it is connected with lake Erie by the Welland canal, with the Erie canal and New York by the Oswego canal, and by the Rideau canal with the Ottawa. Lake Ontario is subject to violent storms, and it is probably owing chiefly to the constant agitation of its waters that it freezes only for a few miles from the shore. The shores of lake Ontario are generally very flat, but the bay of Quinte, a long, crooked arm of the lake, which stretches about 50 m., possesses some attractive scenery. Burlington bay, on which Hamilton lies, is a large basin, almost inclosed by a natural, but strangely accumulated bank of sand, which forms a beautiful drive.

ONTARIO, the province. See CANADA.

ONTARIO, PROVINCE OF, formerly Upper Canada or Canada West, the most populous province in the Dominion of Canada. On the n.e. and e. it is bounded by the province of Quebec; on the s.e. and s.s.w. by the St. Lawrence river, the great lakes, and the district of Keewatin; and on the n.w. and n. by Hudson's bay and the North-West territories. Its length from s.e. to n.w. is about 750 m.; from n.e. to s.w. about 500 m.;

area 107,780 sq. miles. The face of the region is diversified by rivers and lakes. A ridge of high land extends in the s.e. portion from Niagara falls n.w. to lake Huron and along the peninsula between that lake and Georgian bay. Other ranges of hills are the Laurentian, crossing the Ottawa river at Quebec, and extending s. and thence w. to Georgian bay; and the Blue mountains, s. of Georgian bay, which attain a height above lake Huron of 1900 feet. The slopes are generally gradual and the valleys wide. In the s.w. lies a great plain, extremely fertile and valuable, underlaid by Silurian and Devonian limestones, sandstones, and shales, on which are found beds of clay and gravel. Much of this region abounds in hard-wood forests, and is fertile in wheat, corn, and all kinds of farm products. The principal rivers of the province are the tributaries of the Ottawa river, which forms the boundary between Ontario and the province of Quebec; the French, the Maganetawan, the Severn, and the Nottawasaga, falling into Georgian bay; the Saugeen, the Maitland, and Aux Sables, falling into lake Huron; the Thames, running s. into lake St. Clair; the Grand, flowing s.e. into lake Erie; the Trent, in part of its course called the Otonabee, and the Moira, flowing s.e. into the bay of Quinte; and the Niagara, falling into lake Ontario. The great lakes Superior, Huron, Erie, and Ontario, with their connecting waters, afford a water front to the province of about 3,000 m., with many good harbors. The principal minor lakes are Nipigon, Simcoe, and Nipissing; and the chief bays are the Georgian, Nottawasaga, Owen sound, Long Point, Burlington, and Quinte. The winters throughout the country are very cold, and the heat during summer is occasionally extreme; but the climate is considered healthy.

Ontario, like the rest of Canada, was first settled by the French, and together with the province of Quebec passed into the control of the English in 1760. It became a separate province in 1867. It is divided into 49 counties, subdivided into 88 electoral districts. The principal cities are Toronto, the capital, pop. 56,092; Ottawa, the capital of the dominion, pop. 21,545; Kingston, pop. 12,407; Hamilton, pop. 26,716; and London, pop. 15,816. The largest towns are Brantford, 8,107; St. Catharines, 7,864; Belleville, 7,305; Guelph, 6,878; Chatham, 5,878; Port Hope, 5,114, and Brockville, 5,102. In 1871 the total population of the whole province was 1,620,851, of whom 559,442 were Irish; 439,429 English; 328,889 Scotch; 158,608 German; 75,383 French; 19,992 Dutch; 5,282 Welsh; and 12,978 Indians. At that period 228,708 persons were engaged in agricultural pursuits; 29,082 in commercial occupations; 26,085 in domestic; 93,871 in industrial, 16,759 in professional; and 68,199 were not classified. The greatest number of the inhabitants are settled in the s. and s.w. parts of the province; and, as the foregoing statistics indicate, agriculture is the chief occupation. A large proportion of the soil is of excellent quality, and in the s.w. the influence of the surrounding bodies of water aids the natural richness of the soil. Large crops of wheat are raised, also oats, barley, Indian corn, rye, potatoes, turnips, etc.; and in the s.w. the apple-orchards are very productive; and pears, plums, grapes, cherries, and various kinds of berries thrive. The regions lying between the Ottawa river and the Georgian bay contain large tracts of fertile ground, and produce a variety of timber consisting chiefly of white and red pine. In this district lumbering is extensively carried on, and the sawing of timber is among the principal industries of the province. Chief among the other manufactures are cotton and woolen goods, linen, furniture, iron and hardware, paper, soap, starch, hats, boots, and shoes, steam-engines and locomotives, sewing machines, wooden-ware, and agricultural implements. The foreign trade in 1874 in exports amounted to $25,157,087; and in imports to $49,443,977. The principal merchandise imported was sugar, tea, coal, Indian corn, wheat, iron manufactures, and cotton and woolen goods.

In railroads the province has made great progress during the past 15 years. In 1878 there were 3,528 m. of road in operation, with about 1000 additional m. either under charter or in process of construction. Chief among these were the Canada Southern; the western division of the Grand Trunk; and the Great Western. There are also a number of canals, the principal of which are the Welland, 28 m. long, from Port Dalhousie to Port Colborne; and the Rideau, from Kingston to Ottawa, 126 miles.

The school system affords all children free education, and is under the general management of a chief superintendant. Besides the common schools, the law provides for the establishment and maintenance of classical and English high schools for both sexes; and collegiate institutes. In 1873 there were 4,562 common schools; 108 high schools; 265 academies and private schools; 170 Roman Catholic separate schools; 3 normal schools, and 16 colleges and universities. The total amount expended for educational purposes during the same year was $3,258,125. The public and private libraries in 1873 numbered 4,182, with about 755,302 volumes. The number of newspapers and periodicals published in the province is about 250, among which are 23 daily newspapers, 212 weeklies, and 16 monthlies. The prevailing religious denomination is the Methodist, which in 1871 had 1924 edifices, and 462,264 adherents. Among the other denominations were: Baptist, 279 churches; Episcopal, 511; Presbyterian, 697; and Roman Catholic, 298. The M. E. church in Canada and the British M. E. church each have a bishop. The Anglicans have three dioceses—Toronto, Ontario, and Huron. The Roman Catholics have an archbishop at Toronto, and bishops at London, Hamilton, Kingston, and Ottawa.

The provincial government is administered by a lieutenant-governor, appointed by the governor-general of the Dominion for five years, assisted by an executive council of five members, which includes an attorney-general, commissioner of agriculture, secretary, registrar, treasurer, commmissioner of crown lands, and commissioner of public works. The legislative assembly has only one house of 82 elective members. Voting is by ballot, and the right of suffrage is conferred on all male British subjects 21 years of age, possessed of some property qualification. The judicial power is vested in a court of error and appeal, a court of queen's bench, a court of common pleas, a court of chancery, and minor courts. In the dominion parliament the province of Ontario is represented by 24 senators and 88 members of the house of commons. See CANADA, *ante*.

ONTARIO, a co. in w. New York, having Seneca lake for its s.e. boundary, Canandaigua lake, 16 m. long, on the s., drained by Flint, Honeoye, and Mud creeks, and Canandaigua outlet; 640 sq.m.; pop. '80, 49,377—41,739 of American birth, 589 colored. The surface is composed of hills and valleys, and crossed by high ridges furnishing excellent pasturage, and in some portions covered with groves of ash, beech, elm, sugar-maple, and forests of hard-wood timber. It is intersected by the New York Central and Hudson River and the Northern Central railroads; and the s. terminus of the Sodus Point and Southern railroad is at Canandaigua. The shores of its picturesque lakes, Canandaigua and Seneca, are attractive for summer resort; and the smaller bodies of water, lakes Honeoye, Canadice, and Hemlock, are noted for their beauty. Its soil is a fertile sandy loam with a mixture of clay in some places; having a foundation of limestone and sandstone, and deposits of gypsum and water-limestone. The country is suited to stock-raising, and every variety of grain is produced; also fruit, wool, dairy products, potatoes, and hops. The leading industries are the manufacture of cooperage, saddlery, agricultural implements, tin, copper, and sheet iron ware, bricks, carriages, and wagons, iron castings, leather, malt, woolen goods, lumber, and flour. Co. seat, Canandaigua.

ONTARIO, a township of Wayne co., N. Y.; consisting of the villages of Ontario and Ontario Center, situated on the Ontario Shore branch of the Rome, Watertown, and Ogdensburg railroad; 50 m. from Oswego; pop. '70, 2,295. There are foundries, and railroad machine and repair shops. It is the center of a large fruit-growing region.

ONTENIENTÉ, a t. of Spain, in the province of Valencia, 45 m. s. by w. from Valencia, on the right bank of the Clariano, and near the railway which connects Valencia with Madrid. Linen and woolen fabrics are manufactured here; there are also numerous oil-mills. Pop. 9,508.

ONTOLOGY. See METAPHYSICS.

ONTONAG'ON, a co. in extreme n.w. Michigan, bounded n.w. by lake Superior, s.w by Wisconsin; drained by the Montreal, Ontonagon, Fire Steel, Iron, Presque isle and Black rivers; 2,300 sq.m.; pop. '70, 2,845. The surface is rugged and covered with forests. The mining of copper and iron is the chief employment. Co. seat, Ontonagon.

ONUS PROBANDI, i.e., the burden of proof, is often a difficult question in litigation; but, as a general rule, the plaintiff who institutes the suit is bound to give proof of the allegations on which he relies. There are many nice and technical rules on the subject, both in suits and actions, which are too minute to be here stated.

ONYX, an agate formed of alternating white and black, or white and dark-brown stripes of chalcedony. More rarely, a third color of stripes occurs. The finest specimens are brought from India. Onyx is in much esteem for ornamental purposes. The ancients valued it very highly, and used it much for cameos. Many of the finest cameos in existence are of onyx. The name onyx, however, appears to have been applied by the ancients more extensively than it now is, and even to striped calcareous alabaster, such as is now called onyx marble. The *sardonyx* of the ancients is a variety of onyx, in which white stripes alternate with stripes of a dark-red variety of carnelian, called *sard* or *sarda*. It is one of the rarest and most beautiful kinds of onyx, and is more valued than carnelian.

ONYX MARBLE, a very beautiful material, which first came into general notice in this country in 1862, when the French made a large display of it in the international exhibition. It is a stalagmitic formation, which was discovered by the French in making roads in the province of Oran in Algiers. It is a translucent limestone, containing traces of magnesia and carbonate of iron; its specific gravity is 2.730. The quarries are worked by a company, and the artistic workmen of France are turning it to good account, in the manufacture of very beautiful ornamental works.

OOJEIN. See UJEIN.

OOLITE (Gr. egg-stone), a variety of limestone, often very pure calcareous spar, distinguished by its peculiar structure, being composed of grains connected together by a calcareous cement; the whole much resembling the roe of a fish. The grains are not unfrequently hollow. Many oolites, as in the south of England, are excellent building-stones. There is no important mineralogical differences between oolite and *pisolite*, or pea stone. Oolite, as a geological term, is extended far beyond its mineralogical and original signification.

OOLITE or JURASSIC **GROUP** (in Geology), an extensive and important series of strata of secondary age, underlying the chalk formation, and resting on the trias. In Britain they received the name Oolite because in the district where they were first examined and described by Dr. W. Smith, the limestones contained in them had an oolitic structure (see foregoing article). The name Jurassic has been given to them on the continent because the range of the Jura mountains in the n. w. of Switzerland is almost entirely composed of them. The strata of the group have been arranged in the following order. The maximum thickness of each division is given in feet:

		Feet.
	UPPER OOLITE.	
1.	Purbeck beds	200
2.	Portland beds	170
3.	Kimmeridge clay	600
		970
	MIDDLE OOLITE.	
4.	Coral rag	190
5.	Oxford clay	600
		790
	LOWER OOLITE.	
6.	Cornbrash and forest marble	80
7.	Great oolite and stonesfield slate	150
8.	Fuller's earth	150
9.	Inferior oolite	250
		630
	LIAS.	
10.	Upper lias	300
11.	Marlstone	200
12.	Lower lias	600
		1100
	Total	3,490

It is apparent from this table that the oolitic rocks consist of three extensive clay deposits, each of which forms the basis of a smaller and variable set of sands and limestones; the upper oolites resting on the Kimmeridge clay, the coral rag on the oxford clay, and the lower oolite on the lias.

1. The Purbeck beds, unlike the other oolitic rocks, are chiefly freshwater deposits. Though lithologically they are very similar throughout, the peculiarities of the contained fossils have caused them to be grouped into three series—upper, middle, and lower. The upper Purbecks are purely fresh-water, containing beds of limestone and shale, which abound in shells of lake and river mollusca and cypridea. The stone called Purbeck marble, formerly so extensively used in the ornamental architecture of English churches and other buildings, belongs to this division; it consists of the shells of Paludinæ, held together by a somewhat argillaceous paste. The middle Purbecks are partly fresh-water, and partly brackish or marine. The "cinder-bed," composed of a vast accumulation of shells of *Ostrea distorta*, occurs in this section, and near it is the narrow layer from which Mr. Beckles recently obtained the remains of several mammalia. The lower Purbecks are chiefly fresh-water, with some intercalated brackish or marine beds, and one or two old vegetable soils called by the quarrymen "dirt-beds," which contain the stems of cycadaceous and coniferous plants. 2. The Portland beds consist of oolitic and other limestones interstratified with clays, and passing below into sands and sandstones, from which the well-known building-stone is obtained, of which St. Paul's and many of the principal buildings in London are built. 3. The Kimmeridge clay is generally a dark-gray bituminous shale, with intercalated beds of sand, calcareous grit, and layers of septaria. The dark shale in some places passes into an impure brown shaly coal. 4. The coral rag contains, as its name implies, an abundance of corals, in bluish limestone beds mixed with layers of calcareous grit. The Solenhofen lithographic stone, with its beautifully preserved and varied fossil remains, belongs to this division. 5. The Oxford clay is a dark-blue or blackish clay without corals, but having a large number of beautifully preserved Ammonites and Belemnites. Beds of calcareous sandstone, called Kelloway rock, occur in its lower portion. 6. The cornbrash consists of thin beds of cream-colored limestone, with sandstones and clays, and the forest marble (so named from Wychwood forest) is composed of an argillaceous limestone, with numerous marine fossils, blue marls and shales, and yellow silicious sand. At Bradford, Wiltshire, the forest marble is replaced by a considerable thickness of blue unctuous clay. 7. The great oolite is composed of shelly limestones, sandstones, and shelly calcareous sandstones, and the Stonesfield slate is a slightly oolitic shelly limestone, which splits into very thin slabs, erroneously called "slates:" it is

remarkable for the remains of terrestrial reptiles and mammals found in it. The Bath oolite, a celebrated building-stone, belongs to this division. 8. The fuller's-earth group is a local deposit found near Bath; it consists of a series of blue and yellow shales and marls. some of which have properties fitting them for the use of the fuller. 9. The inferior oolite is composed of a series of beds of pisolitic and shelly limestones, brown marl, and brown sandy limestone, all abounding in fossils. 10. The lias (q.v.) is a great clay deposit. It is divided into the upper and lower lias, which consist of thin beds of limestone scattered through a great thickness of blue clay, and, separating these two groups, the marlstone, or calcareous or ferruginous sandstone. The lias abounds in beautifully preserved fossils.

The oolite occupies, in England, a zone nearly thirty miles in breadth, extending across the country from Yorkshire to Dorsetshire. In Scotland, patches of lias and Oxford clay occur in the islands of Mull and Skye, and on the western shores of the mainland, and beds belonging to the lower oolite are found at Brora, on the east coast of Sutherland, which contain an impure coal. The only oolite rocks in Ireland are a few isolated patches in Antrim, which abound with the fossils of the lower lias. On the continent, rocks of this age occur in Germany and France, but they have been most extensively studied in the Jura mountains, which, though having a height of 6,000 ft. are entirely composed of oolite and cretaceous rocks. The strata are greatly bent and contorted, and as they approach the Swiss Alps, the great mass of which is also formed of oolite, they become completely metamorphosed into clay slates, mica schists, gneiss, and crystalline limestones. Beds of oolite have been noticed in Cutch, in India. In Australia similar beds occur on the western coast, and probably some of the coal-beds of New South Wales, Victoria, and Tasmania belong to the oolite. In both North and South America, fossils, apparently of oolitic age, have been found; but these deposits require to be more exactly examined.

The oolite is remarkable for the abundance of its fossils, and is in this respect in striking contrast to the immediately preceding Triassic and Permian periods. The several fresh-water deposits, and the ancient vegetable surfaces, contain the remains of a considerable number of plants. Ferns still abound, and with them are associated species that are evidently related to the living genera *cupressus*, *araucaria*, and *zamia*.

Corals abound in several of the beds. The brachiopods are the only division of the mollusca that is not largely represented. The conchifers and gasteropods show a great number and variety of new genera, which are nearer the forms of the present day than those that preceded them. But the remarkable feature of molluscan life is the enormous development of the cephalopods. Whole beds are almost entirely made up of their shells. No less than 600 species of ammonites have been described, chiefly from the rocks of this period, and the belemnites were also very numerous. The crinoids have become scarce, but are replaced by star-fishes and sea-urchins. The fresh-water beds contain the remains of many insect forms. The heterocercal-tailed fish give way to the more modern homocercals, and the true sharks and rays make their appearance, though the old cestracionts are still represented by some survivers. The characteristic feature of the oolitic period was its reptiles. The land, the sea, and the air had each their fitting inhabitants of this class. The various species of pterodactyles, some not larger than the bat, others surpassing, in the stretch of their membranous "wing," the size of the largest living bird, were the terrors of the air; while their allies, the monster ichthyosaurs and plesiosaurs, held the mastery of the waters; and the huge megalosaurs, some not less than 30 ft. in length, trod the earth. The few mammalian remains hitherto found have a special interest from their antiquity, being the first evidence of this high order of animals on the globe. They belong, apparently, to marsupial animals; one species is, however, supposed by Owen to have been a hoofed and herbivorous placental mammal.

OOMRAWUTTI, or Amrawati, an important commercial town of British India, in the province of Berar, 86 m. w. by s. from Nagpore, on one of the head-waters of the Purna, a branch of the Tapti. The district which contains it was ceded by the Nizam to the British government; and transit-duties, which formerly much interfered with the commerce of the town, have been abolished. Several considerable business firms are established here; and the chief merchants of upper India and of Bombay have agents, who often make advances to the cotton cultivators of the surrounding country, on security of their crop. There are large cotton warehouses at Oomrawutti. Pop. 23,410.

OONALASKA. See Unalashka.

OORALSK. See Uralsk.

OORFA. See Urfa.

OORGA. See Urga.

OORI, or Limpopo RIVER, an important river system of south-eastern Africa, rising in lat. 26° s. in the high plateau called the Magaliesberg, which forms the northern limit of the basin of the Orange river. Throughout a great part of its course, the Limpopo bounds on the n. the Transvaal territory which its southern affluents drain. It flows in a north-easterly direction through the plateau in which it rises, then turns sharply to the s.e. and s., when it enters the lowlands. It reaches the Indian ocean about 100 m. n. of Delagoa—considerably further s. than was till recently believed. Its course cannot be less than 800 or 900 m. long, and it has numerous large tributaries, the Mariqua, Lipalula, etc. Yet, like most South African rivers, it is navigable only 60 m. from its mouth, which is blocked by a double bar.

OOROOMEYAH, town and lake. See URUMEYAH.

OOSTERHOUT, a flourishing town in the Netherlands, province of North Brabant, 6 m. n.n.e. from Breda, is situated in a well-wooded, fertile district of country. Pop. '71, 8,755, of whom 8,425 belonged to the Roman Catholic church. Much business is done in the grain and cattle markets. There are 14 tanyards, several flourishing beer-brewing establishments, 5 potteries, and 4 brick-works. Oosterhout has a grammar-school, and a nunnery, the inmates of which employ themselves in teaching the children of the poor. The handsome town-house and great Roman Catholic church stand on the market-place, which is shaded with linden trees.

Near Oosterhout is an extensive wood, where are the ruins of the house of Stryen or Oosterhout, formerly the residence of the counts of Stryen, under whose jurisdiction were not only the town and barony of Breda, but also the marquisate of Bergen-op-Zoom.

OOTACAMUND', the chief town in the Neilgherry hills, and the great sanitarium of southern India. These hills are situated between 11°—12° n. lat., and 76°—77° e. long. The elevation of Ootacamund' is 7,400 feet above the sea; the mean temperature being about 49°, the maximum 77°, and the minimum 38°. The average rainfall is 45 inches. Its distance is only about 350 m. from Madras, and it is easy of access, as the railway now conveys the traveler to the foot of the hills. The other stations on the Neilgherries are Coonoor, Kottagherry, and Jackatalla, or Wellington. In the last place there is a fine range of barracks for European troops. The number of European settlers on these hills is increasing. There are thriving plantations of tea and coffee, and the cinchona or quinine plant. Pop. '72, 9,982.

OOTRUM, an Indian fiber, derived from the stem of *dæmia extensa*, a plant of the natural order *asclepiadiaceæ*, abundant in many parts of Hindustan. The fiber is soft, white, silky, and strong, and is regarded as a promising substitute for flax.

O'PAH, or KING-FISH, *Lampris guttatus* or *L. luna*, a fish of the dory (q.v.) family (*zeidæ*), occasionally found in the British seas, but more common in more northern regions, and found not only in the Atlantic and Arctic oceans, but also in the Pacific, as on the coasts of China and Japan. It is of an oval form, greatly compressed, with small thin scales, the mouth small and destitute of teeth, a single dorsal fin much elevated in front and extending almost to the tail. This fish attains a large size, being sometimes 5 ft. long and 150 lbs. in weight. It is brilliantly colored; the upper part of the back and sides rich green, reflecting purple and gold in different lights, the lower parts yellowish-green; round yellowish-white spots above and below the lateral line; all the fins bright vermilion. The flesh is much esteemed; it is red like salmon, and is said to resemble it in flavor.

O'PAL, a mineral which differs from quartz in containing from 5 to 13 per cent of water, its only other essential constituent being silica, although a little alumina, oxide of iron, etc., is often present. It is never found crystallized, and does not exhibit a crystalline structure like quartz. It has a conchoidal fracture, and is very easily broken. There are many varieties, which pass into one another, so that their precise limits cannot be defined, from which has arisen no little confusion of names. The finest kind is called *precious opal* or *noble opal*, and sometimes *oriental opal*. It is semi-transparent or translucent, usually of a bluish or yellowish white color, yellow by transmitted light, and exhibits a beautiful play of brilliant colors, owing to minute fissures which refract the light. It is much valued for setting in rings, brooches, etc., and is polished with a convex surface, never cut into facets, both because of its brittleness, and because its play of colors is thus best exhibited. The ancients valued opals very highly. The Roman senator Nonius preferred exile to giving up an opal to Mark Antony. This opal was still to be seen in the days of Pliny, who ascribes to it a value equal to more than £100,000 sterling. The imperial cabinet of Vienna contains the most celebrated opal now known to exist. It is 5 in. by 2½ inches. The finest opals are almost all brought from Kaschan in Hungary, where they are found disseminated in a trachytic conglomerate. They are mostly very small, but even a very small opal, if really beautiful, is worth four or five pounds; and the price increases very rapidly with increase of size. Precious opal is found also in Saxony, in South America, etc. When the colors are not equally diffused, but in detached spots, jewelers call it *harlequin opal*. There is a dark or blackish variety, apparently tinged by oxide of iron, which occasionally exhibits very beautiful reflections, and is then much prized. *Girasol* (q.v.) and *cacholong* (q.v.) are varieties of opal. What lapidaries call *prime d'opal* is clay-porphyry, or other stone containing many small grains of opal. It is cut into slabs, and made into boxes and other ornamental articles; the stone which contains the opals being often artificially blackened by boiling in oil, and afterwards exposing to a moderate heat.—*Common opal* is semi-transparent, white, yellow, green, red, or brown, and does not exhibit any play of colors. It is not a rare mineral, and is chiefly found in clay-porphyry. *Semi-opal* is more opaque. **Wood**

opal is a petrifaction, and exhibits the form and structure of wood, the place of which has been taken by the siliceous mineral. *Hyalite* and *menilite* are varieties of opal.

OPATAS, an Indian tribe about the Mayo and Yaqui rivers in s. Sonora, Mexico. They number about 30,000, are semi-civilized, and govern themselves. They are often employed by the state authorities to fight the Apaches.

OPELIKA, a t., the co. seat of Lee county, Ala.; 66 m. n.e. of Montgomery, 30 m. n.w. of Columbus; on the Alabama and Cincinnati, the Savannah and Memphis, and the Western Alabama railroads; pop. '70, 5,085. There are factories of chairs, blinds, and carriages; a bank, 2 weekly papers, and 7 churches. The town is the center of a large country trade.

OPELOU'SAS, chief t. of St. Landry's parish, Louisiana, situated on Vermilion river, 50 m. w. of Baton Rouge, 217 m. n.w. of New Orleans; pop. '70, 1546. There are a court-house, 2 banks, 3 weekly papers; and it is the seat of 2 convents. Large quantities of cotton are shipped up the river from this point.

OPEN-BILL, *Anastomus*, a genus of birds of the heron family (*ardeidæ*), natives of the East Indies and of Africa, remarkable for the structure of the bill, the mandibles being in contact only at the base and tip, with a wide interval between their edges in the middle. They frequent the sea-coast and rivers, and prey on fish and reptiles. One species is well known in India as the Coromandel heron.

OPEN DOORS, LETTERS OF, in Scotch law mean a writ authorizing a messenger to poind or seize goods deposited in lockfast-places, and to break open the locked doors in order to effect the seizure. See HOUSE.

OPERA, a musical drama, in which music forms an essential part, and not a mere accessory accompaniment. As in the higher drama, poetry supersedes the prose of ordinary life, so in the opera, with perhaps as great artistic right, the language of music is introduced at a considerable sacrifice of probability. The libretto or words are, in the modern opera, a peg on which to hang the music, rather than the music an accessory to the written drama. The component parts of an opera are recitatives, duets, trios, quartets, choruses, and finales, accompanied throughout by an orchestra, and the whole is preceded by an instrumental overture (q.v.). Recitative is declamation, which, in its succession of musical sounds and rhythm, strives to assimilate itself as much as possible to the accents of speech, and therefore does not entirely conform to musical rhythm. The accessories of scenic representation are also present, and a ballet (q.v.) is also frequently introduced. In some of the German operas, and in the French *opéra comique*, spoken dialogue without music takes the place of recitative. Among the different varieties of the opera enumerated are the great opera or *opera seria*, of a dignified character; the romantic opera, embracing an admixture of the grave and lively; the comic opera, or *opera buffa;* as well as many intermediate varieties.

The idea of the opera may in part have arisen from the Greek drama, which possessed, to a considerable extent, the operatic character: the choral parts were sung, and the dialogue was delivered in a sustained key, probably resembling operatic recitative more than ordinary speech. The earliest extant example of any composition resembling the lyric drama of the moderns is Adam de la Hale's comic opera of *Li gieus* (*le jeu*) *de Robin et de Marian*, composed in the 13th c., the music of which is wonderful for its date. The next appearance of anything like opera is in the 16th c., when various musical dramas were composed in the madrigalesque style. An opera composed by Zarlino is said to have been performed at Venice when Henry III. passed through that city on his way from Poland to France. About the same time a pastoral called *Dafne*, written by the poet Rinucci, was set to music by Peri; and the same poet and musician conjointly produced the lyric tragedy of *La Morte di Euridice*, which was represented at the theater of Florence in 1600. Claudio Monteverde, one of a society of amateurs known as the "Florentine academy," who devoted themselves avowedly to the study and revival of Greek music, soon afterwards produced his *Orfeo*, a "*favola di musica*," in whose performance an orchestra of no fewer than 36 performers was called into requisition, most of the instruments being, however, only used in twos or threes, and never more than ten at a time. From these beginnings, the opera advanced into one of the permanent institutions of Italy—a development of music at first strongly opposed in character and style to the music of the church. With the progress of music, and the perfecting of the musical instruments which went to form the orchestra, the lyric drama began, towards the middle of last century, to approach its present character. Of the innumerable Italian operas of last century, only Cimarosa's *Matrimonio Segreto* retains its place on the stage. Cherubini, the first of the more modern school, after producing his *Quinto Fabio* at Milan, became naturalized in France: Rossini, who succeeded him in Italy, is the greatest name in the Italian opera. Nothing can exceed the deliciously fresh character of the best-known operas of this truly great musician, *Il Barbiere di Siviglia; Otello; La Gazza Ladra; Semiramide;* and *Guillaume Tell.* Next to them rank the equally well-known works of Bellini, *Norma; La Sonnambula;* and *I Puritani;—Lucia di Lammermoor; Lucrezia Borgia;* and *L'Elisir d'Amore*, the three *chefs-d'œuvre* of Donizetti, alone rivaling them in public estimation. A newer school of opera has recently sprung up in Italy, more grand if less fresh, of which the chief master is Verdi, whose *Ernani; Nabuchodonosor; I Lom-*

bardi; Otello; Rigoletto; Il Trovatore; La Traviata, and others have attained immense popularity in Italy, and wherever the Italian opera has been naturalized.

From Italy the opera was introduced into Germany, where, more scientific and less sensuous than in Italy, it flourished in opposition to national as well as ecclesiastical music. Germany divides with Italy the honor of perfecting orchestral music and the opera. Glück, educated in Italy, produced his *Orfeo* in Vienna, and then went to Paris, where the French adopted him as we did Handel. Mozart was the first composer of operas for the modern orchestra; *Idomeneo, Il Seraglio, Le Nozze di Figaro, Don Giovanni*, and *Zauberflöte* are his principal operatic works, unsurpassed by anything that has succeeded them. The most important German operas composed since their date are *Fidelio* by Beethoven; *Der Freischütz, Euryanthe*, and *Oberon* by Weber; *Faust* by Spohr; and the gorgeous operas of Meyerbeer—*Robert le Diable, Les Huguenots* and *Le Prophète*, and *L'Étoile du Nord*. *Les Huguenots*, notwithstanding its involving enormous difficulties in representation, keeps its place in every operatic theater in Europe. Wagner, the chief exponent of a more recent school, generally known as that of the "music of the future," has produced the operas of *Tannhäuser, Lohengrin*, etc., which enjoy at present a large share of public favor in Germany, and have also become known in England.

In France, the earliest operatic representation of which we have any record was in 1582. About 1669 the abbot Perrin obtained from Louis XIV. the privilege of establishing an opera in the French language at Paris, and in 1672 the privilege was transferred to Lulli, who may be considered the founder of the French lyrical drama. Lulli's popularity continued during a long period, and was only put an end to by the rise of the German Glück, who, naturalized in Paris, produced there his *Iphigénie in Aulide* and *Alceste*. It is greatly through Glück's influence that the modern French opera has become what it is, a composite work combining French, German, and Italian elements. Its best-known productions include Méhul's *Joseph*, Halévy's *Juive*, Auber's *Masaniello, Fra Diavolo*, and *Diamans de la Couronne*, and Gounod's recent opera of *Faust*. The Italian opera, introduced in Paris in 1646 by cardinal Mazarin, and superseded in 1670, was revived in the beginning of the present century, and has since flourished side by side with the national opera of France.

The possibility of a national English opera seems first to have been shown by Purcell, who through Humphreys, had learned much from Lulli. His music to Dryden's *King Arthur* is very beautiful, though kept throughout subordinate to the business of the drama. *The Beggar's Opera*, as set to music by Dr. Pepusch, was a selection of the airs most popular at the time. It has retained its place on the stage, as also has Dr. Arne's *Artaxerxes*, a translation from Metastasio adapted to music rich in melody. The importation of the Italian opera put a stop, for a time at least, to the further development of an opera in England. In 1706 *Arsinoë*, with English words adapted to Italians airs, was performed at Drury Lane. In 1710 *Almahide*, wholly in Italian, was performed exclusively by Italian singers at the Haymarket theater; and a succession of attempts of the kind ended in the permanent establishment of the Italian opera. The arrival of Handel in England decided the future progress of the opera. That great master was during the greater part of his life an opera composer and opera manager. He composed for the London stage no fewer than 44 operas, German, Italian, and English. These now forgotten operas were of course not the complex compositions of a later period, which could not have been performed in the then imperfect state of orchestral instruments. A recitative was set to music nearly as fast as the composer could put notes on paper, and the songs were accompanied in general by only one violin and bass, the composer sitting at the harpsichord, and supplying what was wanting. From Handel's time onwards, the opera flourished as an exotic in Britain the singers being foreign, and the works performed being either Italian or occasionally German or French. Attempts crowned with some measure of success have latterly been made to establish an opera of a national character in England. Balfe's *Bohemian Girl* and *Rose of Castile* are the best works which this school has produced, and have attained, with other operas by Balfe, Wallace, and Macfarren, a considerable measure of popularity. See Hogarth's *Memoirs of the Opera* (London, 1851).

END OF VOL. X.